RDR-GX330

RMT-D229A

SERVICE MANUAL

US Model
Canadian Model

Self Diagnosis Supported model

DVD+ReWritable

DVD VIDEO/R/RW

COMPACT disc DIGITAL VIDEO

SPECIFICATIONS

System

Laser: Semiconductor laser
Channel coverage:
NTSC
VHF: 2 to 13
UHF: 14 to 69
CATV: A-8 to A-1, A to W, W+1 to W+84
Video reception: Frequency synthesizer system
Audio reception: Inter carrier system
Antenna: 75-ohm antenna terminal for VHF/UHF
Timer: Clock: Quartz locked/Timer indication: 12-hour cycle (digital)/ Power back-up duration: 1 hour
Video recording format: MPEG-2, MPEG-1
Audio recording format/applicable bit rate: Dolby Digital 2 ch
256 kbps/128 kbps (in EP and SLP mode)

Inputs and outputs

LINE OUT
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.286 Vp-p
LINE 1 IN/LINE 2 IN
(AUDIO): Phono jack/2 Vrms/more than 22 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.286 Vp-p
DV IN: 4-pin/i.LINK S100
DIGITAL OUT (COAXIAL): Phono jack/ 0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT (Y, P_B, P_R):
Phono jack/Y: 1.0 Vp-p/
P_B, P_R: 0.7 Vp-p

General

Power requirements: 120 V AC, 60 Hz
Power consumption: 22 W
Dimensions (approx.):
430 × 58 × 291 mm
(17 × 2 3/8 × 11 1/2 in.) (width/height/ depth) incl. projecting parts
Mass (approx.): 3.1 kg (6.83 lb)
Operating temperature:
5ºC to 35ºC (41ºF to 95ºF)
Operating humidity: 25% to 80%
Supplied accessories:
Audio/video cord (1)
Power cord (1)
Antenna cable (1)
Remote commander (remote) (1)
Size AA (R6) batteries (2)

Specifications and design are subject to change without notice.

DVD RECORDER

SONY

WARNING!!

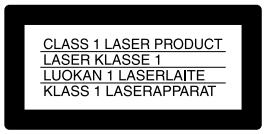
WHEN SERVICING, DO NOT APPROACH THE LASER EXIT WITH THE EYE TOO CLOSELY. IN CASE IT IS NECESSARY TO CONFIRM LASER BEAM EMISSION, BE SURE TO OBSERVE FROM A DISTANCE OF MORE THAN 25 cm FROM THE SURFACE OF THE OBJECTIVE LENS ON THE OPTICAL PICK-UP BLOCK.

CAUTION:

The use of optical instrument with this product will increase eye hazard.

CAUTION

Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.



SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ OR DOTTED LINE WITH MARK ⚠ ON THE SCHEMATIC DIAGRAMS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY.

Unleaded solder

Boards requiring use of unleaded solder are printed with the lead-free mark (LF) indicating the solder contains no lead.
(Caution: Some printed circuit boards may not come printed with the lead free mark due to their particular size.)

: LEAD FREE MARK

Unleaded solder has the following characteristics.

- Unleaded solder melts at a temperature about 40°C higher than ordinary solder.
  Ordinary soldering irons can be used but the iron tip has to be applied to the solder joint for a slightly longer time.
  Soldering irons using a temperature regulator should be set to about 350°C.
  Caution: The printed pattern (copper foil) may peel away if the heated tip is applied for too long, so be careful!
- Strong viscosity
  Unleaded solder is more viscous (sticky, less prone to flow) than ordinary solder so use caution not to let solder bridges occur such as on IC pins, etc.
- Usable with ordinary solder
  It is best to use only unleaded solder but unleaded solder may also be added to ordinary solder.

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer.

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, through functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.
6. Flexible Circuit Board Repairing
   - Keep the temperature of the soldering iron around 270˚C during repairing.
   - Do not touch the soldering iron on the same conductor of the circuit board (within 3 times).
   - Be careful not to apply force on the conductor when soldering or unsoldering.

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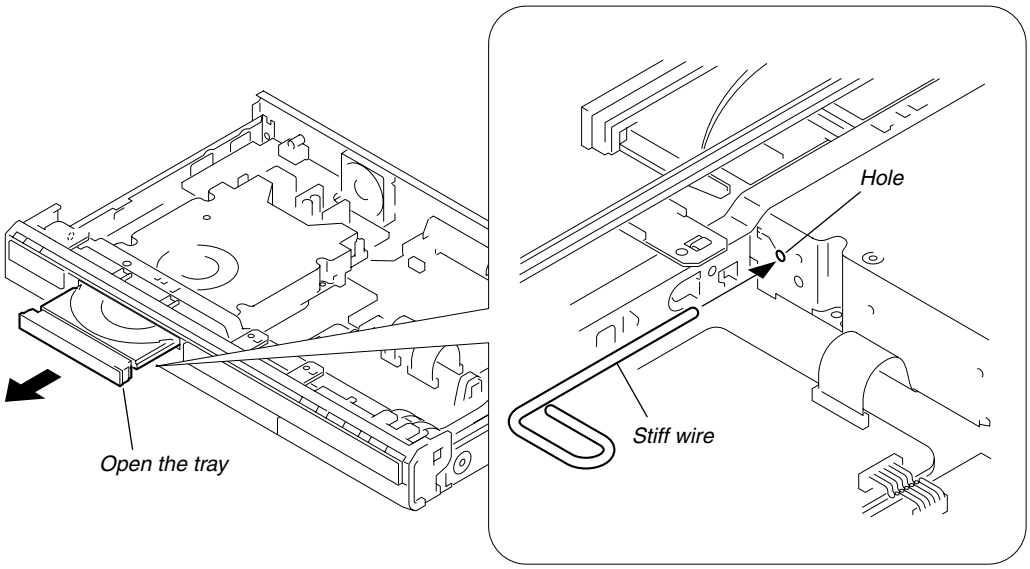
SERVICE NOTE

1. DISK REMOVAL PROCEDURE IF THE TRAY CANNOT BE EJECTED (FORCED EJECTION)

1. Remove the upper case.
2. Insert the stiff wire in the hole and eject the tray.



NOTES DURING THE FORCED EJECTION

1. If the forced ejection is executed while a blank disc media (DVD±RW, ±R) exists on the tray

• Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) in the tray and then close the tray.

Note1: If you close the tray while it is empty, ejection of the tray becomes impossible.

Note2: If you close the tray with a CD disc inserted in it, the CD can be ejected. However, if you close the tray while it is empty, there can be a case that ejection of the tray becomes impossible.

Note3: Even if you replace the DVD drive unit while the tray remains under the state as described above, the situation cannot be improved.

2. If the tray cannot be ejected while the disc is not inserted

• Execute the forced ejection.

• Insert a DVD-ROM (DVD test disc, DVD software available on the market, or the like) on the tray and try to close the tray.
(There are cases that it recovers the trouble.)

3. Contents of forcedly ejected blank disc media (DVD±RW, ±R) can be damaged. (There can be a case that initialization is also impossible.)

MEMO

SECTION 1
GENERAL

This section is extracted from instruction manual.
(RDR-GX330 : 2-672-839-11(1))

WARNING

To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.
To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.
The AC power cord must be changed only at a qualified service shop.

CAUTION

The use of optical instruments with this product will increase eye hazard. As the laser beam used in this DVD recorder is harmful to eyes, do not attempt to disassemble the cabinet.
Refer servicing to qualified personnel only.

This label is located on the laser protective housing inside the enclosure.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For customers in the U.S.A

Owner's Record

The model and serial numbers are located at the rear of the unit. Record the serial number in the space provided below. Refer to them whenever you call upon your Sony dealer regarding this product.
Model No. RDR-GX330
Serial No._____

CAUTION

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.
– Increase the separation between the equipment and receiver.
– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
– Consult the dealer or an experienced radio/TV technician for help.

Precaution

Install this system so that the AC power cord can be unplugged from the wall socket immediately in the event of trouble.

Precautions

This equipment has been tested and found to comply with the limits set out in the EMC Directive using a connection cable shorter than 3 meters.

On safety

Should any solid object or liquid fall into the cabinet, unplug the recorder and have it checked by qualified personnel before operating it any further.

On power sources

- The recorder is not disconnected from the AC power source as long as it is connected to the wall outlet, even if the recorder itself has been turned off.
- If you are not going to use the recorder for a long time, be sure to disconnect the recorder from the wall outlet. To disconnect the AC power cord, grasp the plug itself; never pull the cord.

On placement

- Place the recorder in a location with adequate ventilation to prevent heat build-up in the recorder.
- Do not place the recorder on a soft surface such as a rug that might block the ventilation holes.
- Do not place the recorder in a confined space such as a bookshelf or similar unit.
- Do not place the recorder in a location near heat sources, or in a place subject to direct sunlight, excessive dust, or mechanical shock.
- Do not place the recorder in an inclined position. It is designed to be operated in a horizontal position only.
- Keep the recorder and discs away from equipment with strong magnets, such as microwave ovens, or large loudspeakers.
- Do not place heavy objects on the recorder.
- To prevent fire or shock hazard, do not place objects filled with liquids, such as vases, on the apparatus.

On recording

Make trial recordings before making the actual recording.

On compensation for lost recordings

Sony is not liable and will not compensate for any lost recordings or relevant losses, including when recordings are not made due to reasons including recorder failure, or when the contents of a recording are lost or damaged as a result of recorder failure or repair undertaken to the recorder. Sony will not restore, recover, or replicate the recorded contents under any circumstances.

Copyrights

- Television programs, films, video tapes, discs, and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws. Also, use of this recorder with cable television transmission may require authorization from the cable television transmitter and/or program owner.
- This product incorporates copyright protection technology that is protected by U.S. patents and other intellectual property rights. Use of this copyright protection technology must be authorized by Macrovision, and is intended for home and other limited viewing uses only unless otherwise authorized by Macrovision. Reverse engineering or disassembly is prohibited.

Copy guard function

Since the recorder has a copy guard function, programs received through an external tuner (not supplied) may contain copy protection signals (copy guard function) and as such may not be recordable, depending on the type of signal.

IMPORTANT NOTICE

Caution: This recorder is capable of holding a still video image or on-screen display image on your television screen indefinitely. If you leave the still video image or on-screen display image displayed on your TV for an extended period of time you risk permanent damage to your television screen. Plasma display panels and projection televisions are especially susceptible to this.

If you have any questions or problems concerning your recorder, please consult your nearest Sony dealer.

➡continued

Important Safety Instructions

1) Read these instructions.
2) Keep these instructions.
3) Heed all warnings.
4) Follow all instructions.
5) Do not use this apparatus near water.
6) Clean only with dry cloth.
7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8) Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11) Only use attachments/accessories specified by the manufacturer.
12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13) Unplug this apparatus during lightning storms or when unused for long periods of time.
14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

About this manual

- In this manual, "disc" is used as a general reference for the DVDs or CDs unless otherwise specified by the text or illustrations.
- Icons, such as DVD, listed at the top of each explanation indicate what kind of media can be used with the function being explained.
- Instructions in this manual describe the controls on the remote. You can also use the controls on the recorder if they have the same or similar names as those on the remote.
- The on-screen display illustrations used in this manual may not match the graphics displayed on your TV screen.
- The explanations regarding DVDs in this manual refer to DVDs created on this recorder. The explanations do not apply to DVDs that are created on other recorders and played back on this recorder.

Quick Guide to Disc Types

Recordable and playable discs

Type		Disc Logo	Icon used in this manual	Formatting (new discs)	Compatibility with other DVD players (finalizing)
DVD+RW		DVD+ReWritable / DVD+ReWritable High Speed	+RW	Automatically formatted in +VR mode (DVD+RW VIDEO)	Playable on DVD+RW compatible players (automatically finalized)
DVD-RW	VR mode	DVD RW	-RW VR	Format in VR mode (page 27)	Playable only on VR mode compatible players (finalization unnecessary)
	Video mode	DVD RW / RW 2	-RW Video	Format in Video mode (page 27)	Playable on most DVD players (finalization necessary) (page 35)
DVD+R / DVD+R DL		DVD+R / DVD+R DL	+R	Automatically formatted in +VR mode (DVD+R VIDEO)	Playable on most DVD players (finalization necessary) (page 35)
DVD-R	VR mode	DVD R R4.7	-R VR	Format in VR mode (page 27)*1 Formatting is performed using the "Disc Information" display.	Playable only on DVD-R in VR mode compatible players (finalization necessary) (page 35)
	Video mode		-R Video	Automatically formatted in Video mode	Playable on most DVD players (finalization necessary) (page 35)

Usable disc versions (as of March 2006)

- 8x-speed or slower DVD+RWs
- 6x-speed or slower DVD-RWs (Ver.1.1, Ver.1.2 with CPRM*2)
- 16x-speed or slower DVD+Rs
- 16x-speed or slower DVD-Rs (Ver.2.0, Ver.2.1 with CPRM*2)
- 8x-speed or slower DVD+R DL (Double Layer) discs

"DVD+RW," "DVD-RW," "DVD+R," "DVD+R DL," and "DVD-R" are trademarks.

*1 When an unformatted DVD-R is inserted into this recorder, it is automatically formatted in Video mode. To format a new DVD-R in VR mode, format using the "Disc Information" display (page 27).

*2 CPRM (Content Protection for Recordable Media) is a coding technology that protects copyrights for images.

Discs that cannot be recorded on

- 8 cm discs
- DVD-R DL (Dual Layer) discs

→continued

Playable discs

Type	Disc Logo	Icon used in this manual	Characteristics
DVD VIDEO	DVD VIDEO	DVD	Discs such as movies that can be purchased or rented This recorder also recognizes DVD-R Dual Layer (Video mode) discs as DVD Video compatible discs.
VIDEO CD	COMPACT disc DIGITAL VIDEO	VCD	VIDEO CDs or CD-Rs/CD-RWs in VIDEO CD/Super VIDEO CD format
CD	COMPACT disc DIGITAL AUDIO	CD	Music CDs or CD-Rs/CD-RWs in music CD format
DATA DVD	—	DATA DVD	DVD+RWs/DVD+Rs/DVD-RWs/DVD-Rs/DVD-ROMs containing JPEG image files
DATA CD	—	DATA CD	CD-ROMs/CD-Rs/CD-RWs containing either MP3 audio tracks or JPEG image files
8 cm DVD+RW/DVD-RW/DVD-R	—	—	8 cm DVD+RW, DVD-RW, and DVD-R recorded with a DVD video camera (Still images recorded with a DVD video camera cannot be played.)

"DVD VIDEO" and "CD" are trademarks.

Discs that cannot be played

- PHOTO CDs
- CD-ROMs/CD-Rs/CD-RWs that are recorded in a format different from the formats mentioned in the table above.
- Data part of CD-Extras
- DVD-ROMs/DVD+RWs/DVD-RWs/DVD+Rs/DVD-Rs that do not contain DVD Video or JPEG image files.
- DVD Audio discs
- DVD-RAMs
- HD layer on Super Audio CDs
- DVD VIDEOs with a different region code (page 11).
- DVDs that were recorded on a different recorder and not correctly finalized.
- A disc recorded in a color system other than NTSC, such as PAL

Maximum recordable number of titles

Disc	Number of titles*
DVD-RW/DVD-R	99
DVD+RW/DVD+R	49
DVD+R DL	49

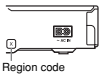
* The maximum length for one title is eight hours.

Note on playback operations of DVD VIDEOs/VIDEO CDs

Some playback operations of DVD VIDEOs/VIDEO CDs may be intentionally set by software producers. Since this recorder plays DVD VIDEOs/VIDEO CDs according to the disc contents the software producers designed, some playback features may not be available. See the instructions supplied with the DVD VIDEOs/VIDEO CDs.

Region code (DVD VIDEO only)

Your recorder has a region code printed on the rear of the unit and will only play DVD VIDEOs (playback only) labeled with identical region codes. This system is used to protect copyrights.
DVD VIDEOs labeled (ALL) will also play on this recorder.
If you try to play any other DVD VIDEO, the message "Playback prohibited by region code." will appear on the TV screen.
Depending on the DVD VIDEO, no region code indication may be labeled even though playing the DVD VIDEO is prohibited by area restrictions.



Region code

Music discs encoded with copyright protection technologies

This product is designed to play back discs that conform to the Compact Disc (CD) standard.
Recently, various music discs encoded with copyright protection technologies are being marketed by some record companies. Please be aware that among those discs, there are some that do not conform to the CD standard and may not be playable by this product.

Note on DualDiscs

A DualDisc is a two sided disc product which mates DVD recorded material on one side with digital audio material on the other side. However, since the audio material side does not conform to the Compact Disc (CD) standard, playback on this product is not guaranteed.

Notes

- Some DVD+RWs/DVD+Rs, DVD-RWs/DVD-Rs, or CD-RWs/CD-Rs cannot be played on this recorder due to the recording quality or physical condition of the disc, or the characteristics of the recording device and authoring software. The disc will not play if it has not been correctly finalized. For more information, see the operating instructions for the recording device.
- You cannot mix VR mode and Video mode on the same DVD-RW. To change the disc's format, reformat the disc (page 37). Note that the disc's contents will be erased after reformatting.
- You cannot shorten the time required for recording even with high-speed discs.
- It is recommended that you use discs with "For Video" printed on their packaging.
- You cannot add new recordings to DVD+Rs, DVD-Rs, or DVD-RWs (Video mode) that contain recordings made on other DVD equipment.
- In some cases, you may not be able to add new recordings to DVD+RWs that contain recordings made on other DVD equipment. If you do add a new recording, note that this recorder will rewrite the DVD menu.
- You cannot edit recordings on DVD+RWs, DVD-RWs (Video mode), DVD+Rs, or DVD-Rs that are made on other DVD equipment.
- If the disc contains PC data unrecognizable by this recorder, the data may be erased.
- You may not be able to record on some recordable discs, depending on the disc.

Hooking Up the Recorder

Follow steps 1 through 6 to hook up and adjust the settings of the recorder. Do not connect the AC power cord until you reach “Step 4: Connecting the AC Power Cord” on page 19.

Notes
- See “Specifications” (page 89) for a list of supplied accessories.
- Plug in cords securely to prevent unwanted noise.
- Refer to the instructions supplied with the components to be connected.
- You cannot connect this recorder to a TV that does not have a video input jack.
- Be sure to disconnect the AC power cord of each component before connecting.

Step 1: Connecting the Antenna Cable

Select one of the following antenna hookups.

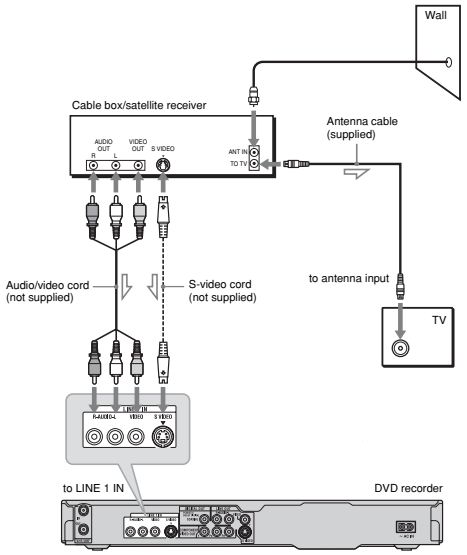
If you have	Hookup
A: Cable box or satellite receiver with a video/audio output	A (page 13)
B: Cable box with an antenna output only	B (page 14)
C: Cable without cable box, or antenna only (no cable TV)	C (page 15)

NOTE TO CATV SYSTEM INSTALLER (IN USA)
This reminder is provided to call the CATV system installer’s attention to Article 820- 40 of the NEC that provides guidelines for proper grounding and, in particular, specifies that the cable ground shall be connected to the grounding system of the building, as close to the point of cable entry as practical.

Notes
- If your antenna is a flat cable (300-ohm twin lead cable), use an external antenna connector (not supplied) to connect the antenna to the recorder.
- If you have separate cables for VHF and UHF antennas, use a UHF/VHF band mixer (not supplied) to connect the antenna to the recorder.

A: Cable box or satellite receiver with a video/audio output

With this hookup, you can record any channel on the cable box or satellite receiver. Be sure that the satellite receiver or cable box is turned on.
To watch cable or satellite channel, you need to match the channel on the recorder (L1) to the input jack connected to the cable box or satellite receiver (LINE 1 IN).



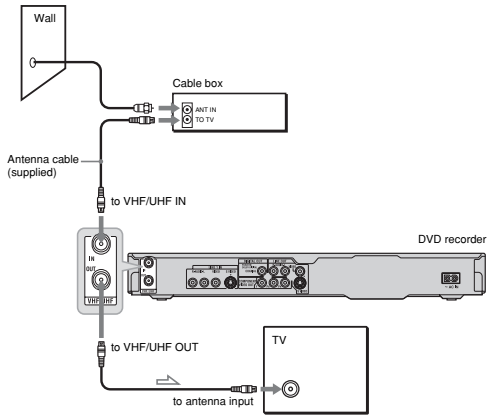
: Signal flow

Hints
- If your cable box or satellite receiver has an S-video jack, you can use an S-video cord (not supplied) instead of the audio/video cord.
- If you connect an S-video cord to the LINE 1 IN jack, set “Line1 Input” of the “Line Input” to “S Video” in the “Video” setup (page 75).

➞continued

B: Cable box with an antenna output only

With this hookup, you can record any channel on the satellite receiver or cable box. Be sure that the satellite receiver or cable box is turned on.
To watch cable programs, you need to match the channel on the recorder (2ch, 3ch, or 4ch) to the antenna output channel on the cable box (2ch, 3ch, or 4ch).

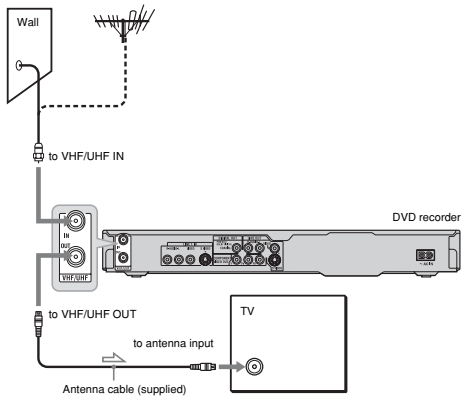


: Signal flow

Note
When using this connection, set “Antenna / Cable” of the “Tuner Preset” to “Antenna” in the “Basic” setup (page 71).

C: Cable without cable box, or antenna only (no cable TV)

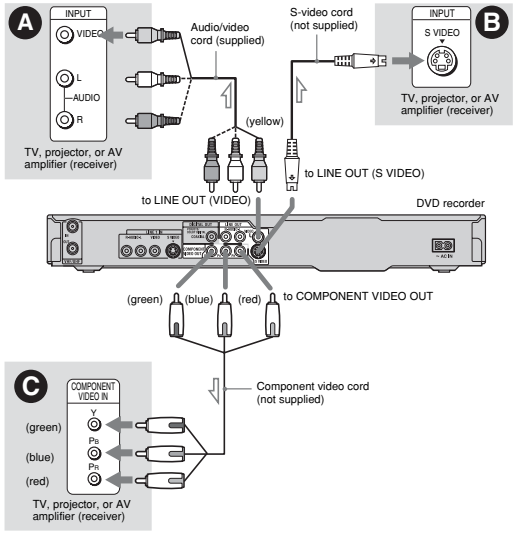
Use this hookup if you watch cable channels without a cable box. Also use this hookup if you are using a VHF/UHF antenna or separate VHF and UHF antennas.
With this hookup, you can record any channel by selecting the channel on the recorder.



: Signal flow

Step 2: Connecting the Video Cords

Select one of the following patterns, Ⓐ through Ⓒ, according to the input jack on your TV monitor, projector, or AV amplifier (receiver). This will enable you to view pictures.



: Signal flow

Ⓐ Video input jack
You will enjoy standard quality images.

Ⓑ S VIDEO input jack
You will enjoy high quality images.

Ⓒ Component video input jacks (Y, PB, PR)
You will enjoy accurate color reproduction and high quality images.
If your TV accepts progressive 480p format signals, you must use this connection. Then set "Progressive Output" of "Video Output" to "On" in the "Video" setup to send progressive video signals. For details, see "Progressive Output" on page 74.

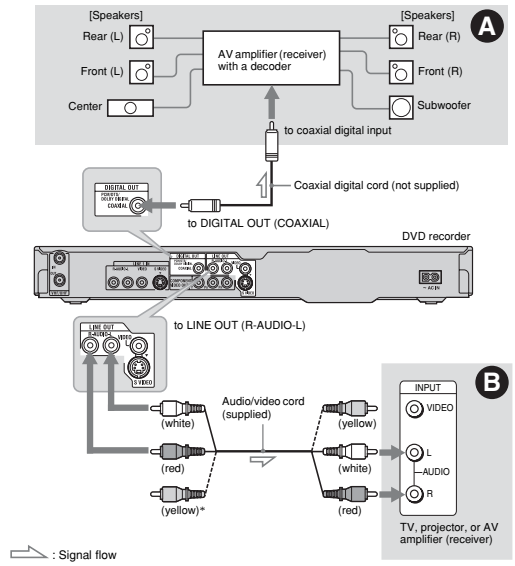
When playing "wide screen" images
Some recorded images may not fit your TV screen. To change the picture size, see page 74.

If you are connecting to a VCR
Connect your VCR to the LINE IN jack on the recorder (page 24).

Note
Do not connect more than one type of video cord between the recorder and your TV at the same time.

Step 3: Connecting the Audio Cords

Select one of the following patterns, Ⓐ or Ⓑ, according to the input jack on your TV monitor, projector, or AV amplifier (receiver). This will enable you to listen to sound.



: Signal flow

* The yellow plug is used for video signals (page 16).

Ⓐ Digital audio input jack
If your AV amplifier (receiver) has a Dolby*1 Digital or DTS*2 decoder and a digital input jack, use this connection. You can enjoy Dolby Digital (5.1ch) and DTS (5.1ch) surround effects.

Ⓑ Audio L/R (left/right) input jacks
This connection will use your TV's or stereo amplifier's (receiver's) two speakers for sound.

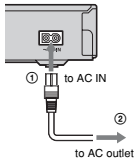
Hint
For correct speaker location, see the operating instructions supplied with the connected components.

Notes
- Do not connect your TV's audio output jacks to the LINE IN (R-AUDIO-L) jacks at the same time. This will cause unwanted noise to come from your TV's speakers.
- With connection Ⓑ, do not connect the LINE IN (R-AUDIO-L) and LINE OUT (R-AUDIO-L) jacks to your TV's audio output jacks at the same time. This will cause unwanted noise to come from your TV's speakers.
- With connection Ⓐ, after you have completed the connection, make the appropriate settings under "Easy Setup - Audio Connection" (page 23). Otherwise, no sound or a loud noise will come from your speakers.

*1 Manufactured under license from Dolby Laboratories.
"Dolby" and the double-D symbol are trademarks of Dolby Laboratories.
*2 "DTS" and "DTS Digital Out" are trademarks of Digital Theater Systems, Inc.

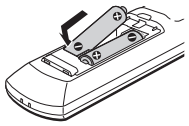
Step 4: Connecting the AC Power Cord

Connect the supplied AC power cord to the AC IN terminal of the recorder. Then plug the recorder and TV power cords into the AC outlet. After you connect the AC power cord, **you must wait for a short while before operating the recorder.** You can operate the recorder once the front panel display lights up and the recorder enters standby mode.
If you connect additional equipment to this recorder (page 24), be sure to connect the AC power cord after all connections are complete.



Step 5: Preparing the Remote

You can control the recorder using the supplied remote. Insert two Size AA (R6) batteries by matching the ⊕ and ⊖ ends on the batteries to the markings inside the battery compartment. When using the remote, point it at the remote sensor on the recorder.



Notes

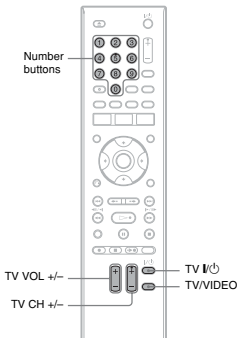
- If the supplied remote interferes your other Sony DVD recorder or player, change the command mode number for this recorder (page 21).
- Use the batteries correctly to avoid possible leakage and corrosion. Should leakage occur, do not touch the liquid with bare hands. Observe the following:
  - Do not use a new battery with an old battery, or batteries of different manufacturers.
  - Do not attempt to recharge the batteries.
  - If you do not intend to use the remote for an extended period of time, remove the batteries.
  - If battery leakage occurs, wipe out any liquid inside the battery compartment, and insert new batteries.
- Do not expose the remote sensor (marked on the front panel) to strong light, such as direct sunlight or a lighting apparatus. The recorder may not respond to the remote.

Controlling TVs with the remote

You can adjust the remote's signal to control your TV.

Notes

- Depending on the connected unit, you may not be able to control your TV with some or all of the buttons below.
- If you enter a new code number, the code number previously entered will be erased.
- When you replace the batteries of the remote, the code number may be reset to the default setting. Set the appropriate code number again.



1 Hold down the TV I/⏻ button located at the bottom of the remote.
Do not press the I/⏻ button at the top of the remote.

2 With the TV I/⏻ button pressed down, enter the TV's manufacturer code using the number buttons.
For instance, to enter "09," press "0" then "9." After you enter the last number, release the TV I/⏻ button.

Code numbers of controllable TVs
If more than one code number is listed, try entering them one at a time until you find the one that works with your TV.

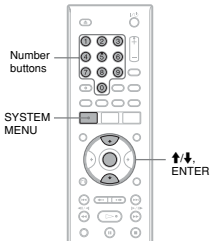
Manufacturer	Code number
Sony	01 (default)
Hitachi	02
MGA/Mitsubishi	13
NEC	04
Panasonic	19
Philips	21
Pioneer	16
RCA	10
Samsung	20
Sharp	18
Toshiba	07

The remote performs the following:

Buttons	Operations
TV I/⏻	Turns your TV on or off
TV VOL +/–	Adjusts the volume of your TV
TV CH +/–	Selects the channel on your TV
TV/VIDEO	Switches your TV's input source

If you have a Sony DVD player or more than one Sony DVD recorder

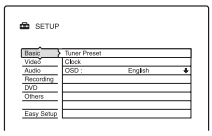
If the supplied remote interferes with your other Sony DVD recorder or player, set the command mode number for this recorder and the supplied remote to one that differs from the other Sony DVD recorder or player after you have completed "Step 6: Easy Setup." The default command mode setting for this recorder and the supplied remote is DVD3.



1 Check that "Easy Setup" (page 23) has been finished. If "Easy Setup" has not been finished, first perform "Easy Setup."

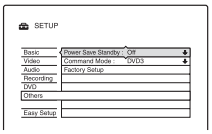
2 Press SYSTEM MENU.
The System Menu appears.

3 Select "SETUP," and press ENTER.

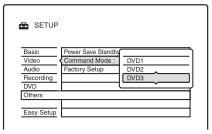


→continued

4 Select "Others," and press ENTER.



5 Select "Command Mode," and press ENTER.



6 Select a Command Mode (DVD1, DVD2, or DVD3), and press ENTER.

7 Set the Command Mode for the remote so it matches the Command Mode for the recorder you set above.
Follow the steps below to set the Command Mode on the remote.
① Hold down ENTER.
② While holding down ENTER, enter the Command Mode code number using the number buttons.

Command Mode	Code number
DVD1	number button 1
DVD2	number button 2
DVD3	number button 3

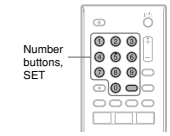
③ Hold down both the number and ENTER buttons at the same time for more than three seconds.

To check the Command Mode for the recorder
Press ■ STOP on the recorder when the recorder is turned off. The Command Mode for the recorder appears in the front panel display.

If the Command Mode for the recorder has not been changed, set the Command Mode for the remote to the default setting of DVD3. If the Command Mode for the remote is changed to DVD1 or DVD2, you will be unable to operate this recorder.

Changing channels of the recorder using the remote

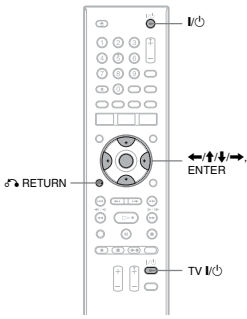
You can change channels of the recorder using the number buttons.



Example: for channel 50
Press "5," "0," then press SET.

Step 6: Easy Setup

Make the basic adjustments by following the on-screen instructions in "Easy Setup."



1 Turn on the recorder and your TV. Then switch the input selector on your TV so that the signal from the recorder appears on your TV screen.
The initial settings message appears.
- If this message does not appear, select "Easy Setup" from "SETUP" in the System Menu ("Settings and Adjustments" on page 71).

2 Press ENTER.
Follow the on-screen instructions to make the following settings.

◆Easy Setup - OSD
Select a language for the on-screen displays.

◆Easy Setup - Clock
Select "Manual" and set the clock using ←/↑/↓/→, then press ENTER. The day of the week is set automatically.
If you used antenna hookup C (page 15), you can select "Auto." The recorder will automatically search for a channel that carries a time signal when you turn off the recorder after finishing Easy Setup.

◆Easy Setup - Tuner Preset
Select whether or not you have a cable connection.
The Tuner Preset function automatically searches for all of the receivable channels and presets them.
To set the channels manually, see page 71.

◆Easy Setup - TV Type (page 74)
If you have a wide-screen TV, select "16:9." If you have a standard TV, select either "4:3 Letter Box" (shrink to fit) or "4:3 Pan Scan" (stretch to fit). This will determine how "wide-screen" images are displayed on your TV.

◆Easy Setup - Audio Connection
If you connected an AV amplifier (receiver) using a coaxial cord, select "Yes : DIGITAL OUT" and set the digital output signal (page 76).

3 Press ENTER when "Finish" appears.
"Easy Setup" is finished.

To return to the previous step
Press ↩ RETURN.

Hint
If you want to run "Easy Setup" again, select "Easy Setup" from "SETUP" in the System Menu (page 82).

Notes

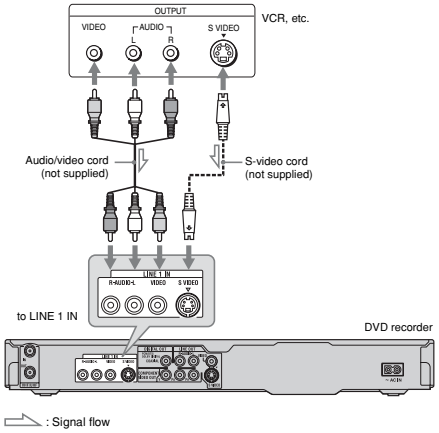
- If you use an S-video cord to connect your cable box or satellite receiver, set "Line1 Input" of the "Line Input" to "S Video" in the "Video" setup (page 75).
- If there are only a few channels in your area that carry time signals, setting the clock automatically may take up to about 20 minutes after the recorder turns off. If nothing happens even after you wait about 20 minutes, set the clock manually in "Clock" of "Basic" (page 72).

Connecting a VCR or Similar Device

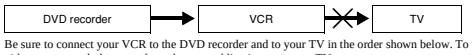
After disconnecting the recorder's AC power cord from the AC outlet, connect a VCR or similar recording device to the LINE IN jacks of this recorder.
Use the DV IN jack on the front panel if the equipment has a DV output jack (i.LINK jack) (page 66).
For details, refer to the instruction manual supplied with the connected equipment.
To record on this recorder, see "Recording from connected equipment without a timer" on page 48.

Connecting to the LINE 1 IN jacks

Connect a VCR or similar recording device to the LINE 1 IN of this recorder. If the equipment has an S-video jack, you can use an S-video cord instead of an audio/video cord.



Notes
- Pictures containing copy protection signals that prohibit any copying cannot be recorded.
- If you pass the recorder signals through a VCR, you may not receive a clear image on your TV screen.

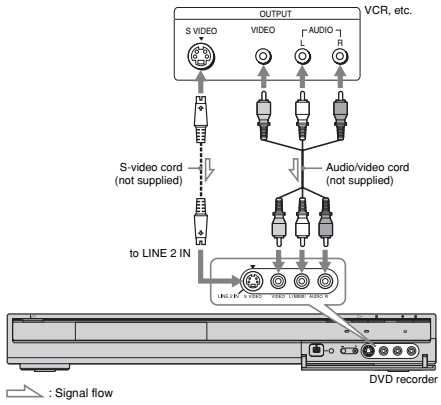


Be sure to connect your VCR to the DVD recorder and to your TV in the order shown below. To watch video tapes, watch the tapes through a second line input on your TV.

- If you disconnect the recorder's AC power cord, you will not be able to view the signals from the connected VCR.

Connecting to the LINE 2 IN jacks on the front panel

Connect a VCR or similar recording device to the LINE 2 IN jacks of this recorder. If the equipment has an S-video jack, you can use an S-video cord instead of an audio/video cord.

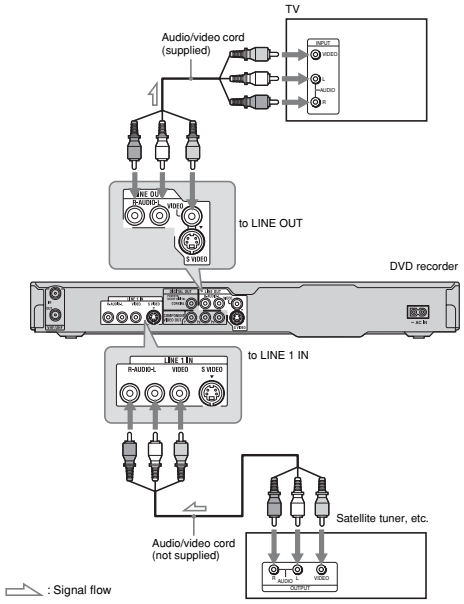


Hint
When the connected equipment outputs only monaural sound, connect to just the L(MONO) and VIDEO input jacks on the front of the recorder. Do not connect the R input jack.

Notes
- Do not connect the yellow LINE IN (VIDEO) jack when using an S-video cord.
- Do not connect the output jack of this recorder to another equipment's input jack with the other equipment's output jack connected to the input jack of this recorder. This may cause noise (feedback).
- Do not connect more than one type of video cord between the recorder and your TV at the same time.

Connecting to a Satellite or Digital Tuner

Connect a satellite or digital tuner to this recorder using the LINE 1 IN jacks. Disconnect the recorder's AC power cord from the AC outlet when connecting the tuner.
To use the Synchro-Rec function, see below.

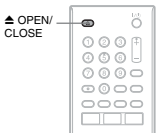


If you want to use the Synchro Rec function
This connection is necessary to use the Synchro-Recording function. See "Recording from connected equipment with a timer (Synchro Rec)" on page 47.

Notes
- Synchro-Recording does not work with some tuners. For details, see the tuner's operating instructions.
- If you disconnect the recorder's AC power cord, you will not be able to view the signals from the connected tuner.

1. Inserting a Disc

+RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD



1 Press ▲ OPEN/CLOSE, and place a disc on the disc tray.

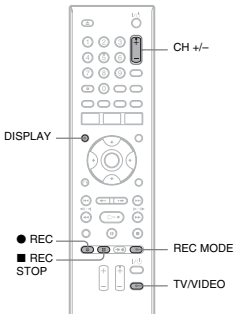
2 Press ▲ OPEN/CLOSE to close the disc tray.
Wait until "LOAD" disappears from the front panel display.
Unused DVDs are formatted automatically.
- For DVD-RW discs
  DVD-RWs are formatted in the recording format (VR mode or Video mode) set by "Format DVD-RW" in the "DVD" setup.
- For DVD-R discs
  DVD-Rs are automatically formatted in Video mode. To format an unused DVD-R in VR mode, format the disc using the "Disc Information" display (page 37) **before** you make a recording.

If the disc is recordable on this recorder, you can manually re-format the disc to make a blank disc (page 37).

2. Recording a Program

+RW -RWVR -RWVideo +R -RVR -RVideo

This section introduces the basic operation to record a current TV program to a disc (DVD). For an explanation of how to make timer recordings, see page 39.



1 Insert a recordable DVD.

2 Press CH +/– to select the channel or input source you want to record.

3 Press REC MODE repeatedly to select the recording mode.
Each time you press the button, the display on the TV screen changes as follows:

HQ → HSP → SP → LSP → SLP → EP → LP → ESP →

For more details about the recording mode, see page 39.

4 Press ● REC.
Recording starts.
Recording stops automatically after 8 hours of continuous recording or when the DVD is full.

→continued

To stop recording
Press ■ REC STOP.
Note that it may take a few seconds for recorder to stop recording.

To watch another TV program while recording
Set your TV to the TV input using the TV/VIDEO button (page 20).

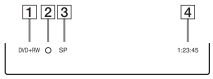
Hint
If you do not want to watch TV while recording, you can turn off the TV. When using a decoder, make sure to leave it on.

Notes
- After pressing ● REC, it may take a short while to start recording.
- You cannot change the recording mode while recording.
- If there is a power failure, the program you are recording may be erased.

Checking the disc status while recording

You can check the recording information such as recording time or disc type.

Press DISPLAY during recording.
The recording information appears.



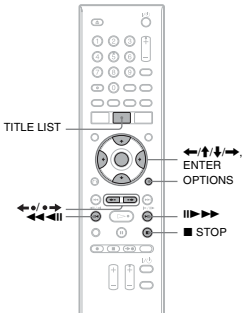
1 Disc type/format
2 Recording status
3 Recording mode
4 Recording time

Press DISPLAY to turn off the display.

3. Playing the Recorded Program (Title List)

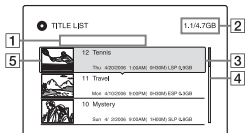
+RW −RWVR −RWVideo +R −RVR −RVideo

To play a recorded title, select the title from the Title List.

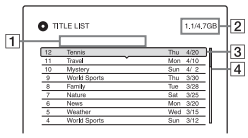


1 Insert a DVD.
See "1. Inserting a Disc" on page 27.
Playback starts automatically depending on the disc.

2 Press TITLE LIST.
To show the extended Title List, press OPTIONS to select "Display List," and press ENTER.
Title List with Thumbnail Images (Example: DVD+RW)

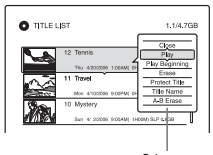


Extended Title List



1 Title type:
Displays the title type (Original or Playlist) for DVD-RWs/DVD-Rs (VR mode).
2 Disc space (remainder/total)
3 Title information:
Displays the title number, title name, and recording date. Title size is shown in the Thumbnail title list.
● (red): Indicates that the title is currently being recorded.
🔒: Indicates the protected title.
4 Scroll bar:
Appears when all of the titles do not fit on the list. To view the hidden titles, press ↑/↓.
5 Title's thumbnail picture:
The still images for each title are displayed.

3 Select a title, and press ENTER.
The sub-menu appears.
The sub-menu displays options applicable only to the selected item. The displayed options differ depending upon the model, situation, and disc type.



Sub-menu

4 Select "Play," and press ENTER.
Playback starts from the selected title.

To stop playback
Press ■ STOP.

To scroll the list display by page (Page mode)
Press ←• REPLAY/ADVANCE •→ while the list display is turned on. Each time you press ←• REPLAY/ADVANCE •→, the entire Title List changes to the next/previous page of titles.

About the Title List for DVD-RWs/DVD-Rs (VR mode)
You can switch the Title List to show Original or Playlist titles.
While the Title List menu is turned on, press ←/→.

To change the title order (Sort)
While the Title List menu is turned on, press OPTIONS to select "Sort Titles." Press ↑/↓ to select the item, and press ENTER.

Order	Sorted
By Date	In order of when the titles were recorded. The title that is recorded most recently is listed at the top.
By Title	In alphabetical order.
By Number	In order of recorded title number.

→continued

To change a title thumbnail picture (Thumbnail) (DVD-RW/DVD-R in VR mode only)
You can select a favorite scene for the thumbnail picture shown in the Title List menu.

1 Press TITLE LIST.
Press ←/→ to switch the Title Lists, if necessary.
2 Select a title, and press ENTER.
The sub-menu appears.
3 Select "Set Thumbnail," and press ENTER.
The display for setting the thumbnail point appears and the title starts to play.
4 While watching the playback picture, press ◀◀/▶▶ to select the scene you want to set for a thumbnail picture, and press ENTER.
Playback pauses.
5 Press ENTER if the scene is correct.
If the scene is incorrect, press ◀II/II▶ to select the scene you want to set for a thumbnail picture, and press ENTER.
The display asks for confirmation.
• To change the thumbnail, press ↑.
6 Select "OK," and press ENTER.
The scene is set for the title's thumbnail picture.

To turn off the Title List
Press TITLE LIST.

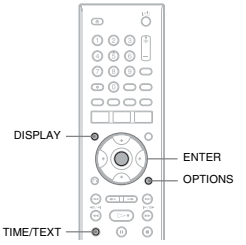
Hints
- After recording, the first scene of the recording (the title) is automatically set as the thumbnail picture.
- You can select "TITLE LIST" from the System Menu.

Notes
- The title names may not appear for DVDs created on other DVD recorders.
- It may take a few seconds for the thumbnail pictures to be displayed.
- After editing, the title thumbnail picture may change to the first scene of the recording (title).

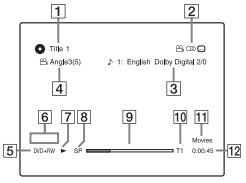
4. Displaying the Playing/Remaining Time and Play Information

+RW −RWVR −RWVideo +R −RVR −RVideo DVD VCD CD DATA DVD DATA CD

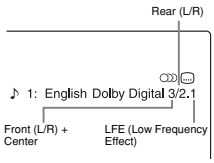
You can check the playing time and remaining time of the current title, chapter, track, or disc. Also, you can check the disc name recorded on the DVD/CD.



Press DISPLAY.
The displays differ depending on the disc type or playing status.



1 Title number/name
(Shows either track number, track name, scene number, or file name for CDs, VIDEO CDs, DATA DVDs, or DATA CDs.)
2 Available functions for DVD VIDEOs (angle/audio/subtitle, etc.), or playback data for DATA DVDs and DATA CDs
3 The current selected function or audio setting (appears only temporarily)
Example: Dolby Digital 5.1 ch



4 The current selected angle
5 Disc type*1/format (page 8)
6 Title type (only appears for Playlists)
7 Play mode
8 Recording mode (page 39)
9 Playing status bar*2
10 Title number (chapter number*3) (page 54)
(Shows either track number, scene number, album number*3, or file number for CDs, VIDEO CDs, DATA DVDs, or DATA CDs.)
11 Album name appears for DATA DVDs or DATA CDs.
For CDs with CD text, press TIME/TEXT.
12 Playing time (remaining time*3)

*1 Displays Super VIDEO CDs as "SVCD," DATA CDs as "CD" and DATA DVDs as "DVD."
*2 Does not appear with VIDEO CDs, DATA DVDs, and DATA CDs.
*3 Displayed when you press TIME/TEXT repeatedly.

Hints
- If "DTS" of "Audio Connection" is set to "Off" in the "Audio" setup, the DTS track selection option will not appear on the screen even if the disc contains DTS tracks (page 76).
- When "Auto Display" is set to "On" (default) in the "Video" setup (page 75), information automatically appears on the screen when the recorder is operated.

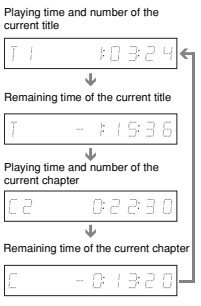
Note
Playing time of MP3 audio tracks may not be displayed correctly.

Checking the playing/remaining time

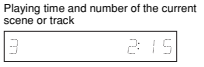
You can view the playing or time information displayed on the front panel display.

Press TIME/TEXT repeatedly.
The displays differ depending on the disc type or playing status.

Example: When playing a DVD


Playing time and number of the current title
T1 0:32:4
Remaining time of the current title
T -1:53:6
Playing time and number of the current chapter
C2 0:23:0
Remaining time of the current chapter
C -0:13:2

Example: When playing a VIDEO CD



→continued

Example: When playing a CD

Track playing time and the current track/index number

↓

Remaining time of the current track

↓

Playing time of the disc

↓

Remaining time of the disc

↓

CD text (when available)

Example: When playing an MP3 audio track

Playing time and number of the current track

↓

Current album number

Example: When viewing a JPEG image

Current file number and total number of files in the current album

↓

Current album number and total number of albums

Notes

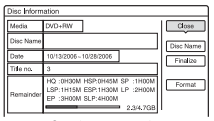
- The recorder can only display the first level of a CD's text, such as the disc name.
- The letters or symbols that cannot be displayed are replaced with "*."
- Playing time of MP3 audio tracks may not be displayed correctly.

Checking the remaining disc space

You can check the remaining disc space using the "Disc Information" display.

1 Insert a disc.
See "1. Inserting a Disc" on page 27.

2 Press OPTIONS to select "Disc Information," and press ENTER.
The "Disc Information" display appears.
Available settings differ depending on the disc type.
Example: When a DVD+RW is inserted.



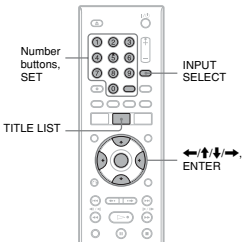
"Remainder" (approximate)
- The remaining recording time in each of the recording modes
- Disc space bar
- Remaining disc space/total disc space

Hint
To increase disc space, see "To open up disc space" (page 59).

5. Changing the Name of a Recorded Program

+RW -RWVR -RWVideo +R -RVR -RVideo

You can label a DVD, title, or program by entering characters. You can enter up to 64 characters for a title or disc name, but the actual number of characters displayed in the menus such as the Title List will vary. The steps below explain how to change the name of the recorded program.



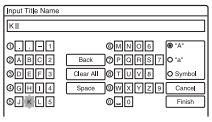
1 Press TITLE LIST.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select "Title Name," and press ENTER.
The display for entering characters appears.

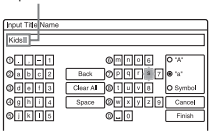
4 Press ←/↑/↓/→ to move the cursor to the right of the display and select "A" (upper-case), "a" (lower-case), or "Symbol," and press ENTER.
The characters for the selected type are displayed.

5 Press ←/↑/↓/→ to select the character you want to enter, and press ENTER.
The selected character appears at the top of the display.
Example: Input Title Name



The type of characters will change according to the language you select in "Easy Setup." Some languages allow you to enter an accent mark.
To enter a letter with an accent mark, select an accent followed by the letter.
Example: Select "` " and then "a" to enter "à."
To insert a space, select "Space."

6 Repeat steps 4 and 5 to enter the remaining characters.
Input row



To erase a character, move the cursor to the right of the character at the input row. Select "Back" and press ENTER.
To insert a character, move the cursor to the right of the point where you want to insert the character. Select the character and press ENTER.
To erase all of the characters, select "Clear All" and press ENTER.

7 Select "Finish," and press ENTER.
To cancel the setting, select "Cancel."

→continued

To use the number buttons
You can also use the number buttons to enter characters. Refer to the number next to each row of letters on your TV screen.

1 In step 5 above, press a number button repeatedly to select a character.
Example:
Press the number 3 button once to enter "D."
Press the number 3 button three times to enter "F."

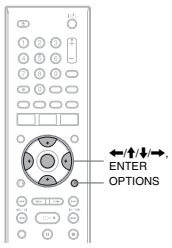
2 Press ENTER or SET and select the next character.

3 Select "Finish" and press ENTER.

Hint
You can switch between "A" (upper-case), "a" (lower-case), or "Symbol" by pressing INPUT SELECT.

6. Labeling and Protecting a Disc

You can execute options effective for the entire disc using the "Disc Information" display.

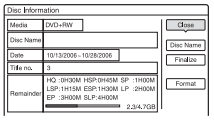


Labeling a disc

+RW -RWVR -RWVideo +R -RVR -RVideo

1 Insert a disc.
See "1. Inserting a Disc" on page 27.

2 Press OPTIONS to select "Disc Information," and press ENTER.
The "Disc Information" display appears.
Available settings differ depending on the disc type.
Example: When the inserted disc is a DVD+RW.



3 Select "Disc Name," and press ENTER.
Enter the disc name in the "Input Disc Name" display (page 33).

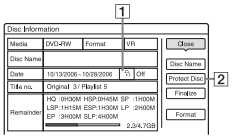
Note
You can enter up to 64 characters for a DVD's disc name. The disc name may not appear when the disc is played on other DVD equipment.

Protecting a disc

-RWVR -RVR

1 Insert a disc.
See "1. Inserting a Disc" on page 27.

2 Press OPTIONS to select "Disc Information," and press ENTER.
The "Disc Information" display appears.
Available settings differ depending on the disc type.
Example: When the inserted disc is a DVD-RW (VR mode).



1 "On"/"Off": Indicates whether protection is set (DVD-RW/DVD-R in VR mode only)

2 "Protect Disc"

3 Select "Protect Disc," and press ENTER.

4 Select "Protect," and press ENTER.

To cancel the protection
Select "Unprotected" in step 4.

Hint
You can set protection for individual titles (page 60).

7. Playing the Disc on Other DVD Equipment (Finalize)

+RW -RWVR -RWVideo +R -RVR -RVideo

Finalizing is necessary when you play discs recorded with this recorder on other DVD equipment.
When you finalize a DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R (Video mode), a DVD menu will be automatically created, which can be displayed on other DVD equipment.
Before finalizing, check the differences between the disc types in the table below.

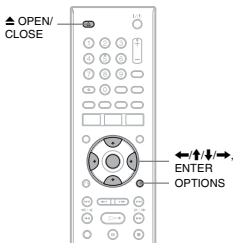
Differences between the disc types

+RW	Discs are automatically finalized when removed from the recorder. However, you may need to finalize the disc for certain DVD equipment, or if the recording time is short. You can edit or record on the disc even after finalizing.
-RWVR	Finalizing is unnecessary when playing a disc on VR format compatible equipment. Even if your other DVD equipment is VR format compatible, you may need to finalize the disc, especially if the recording time is short. You can edit or record on the disc even after finalizing.
-RWVideo	Finalizing is necessary when playing on any equipment other than this recorder. After finalizing, you cannot edit or record on the disc. If you want to record on it again, unfinalize (page 37) or reformat the disc (page 37). However, if you reformat the disc, all recorded contents will be erased.
-RVR	Finalizing is necessary. The disc can be played only on equipment that supports DVD-R in VR mode. After finalizing you cannot edit or record on the disc using this recorder.

→continued

+R
-R Video

Finalizing is necessary when playing on any equipment other than this recorder.
After finalizing, you cannot edit or record on the disc.



Finalizing the disc using ⏏ OPEN/CLOSE button

1 **Make a recording.**
See "2. Recording a Program" on page 27.

2 **Press ⏏ OPEN/CLOSE.**
The display shows the approximate time required for finalizing and asks for confirmation.
For DVD+RWs, the recorder automatically starts finalizing the disc.
After finalizing, the disc will be ejected automatically.

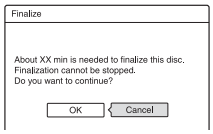
3 **Select "OK," and press ENTER.**
The recorder starts finalizing the disc.
After finalizing, the disc will be ejected automatically.

Finalizing the disc using "Disc Information" display

1 **Insert a disc.**
See "1. Inserting a Disc" on page 27.

2 **Press OPTIONS to select "Disc Information," and press ENTER.**
The "Disc Information" display appears.

3 **Select "Finalize," and press ENTER.**
The display shows the approximate time required for finalizing and asks for confirmation.



4 **Select "OK," and press ENTER.**
The recorder starts finalizing the disc.

Hint
You can check whether the disc has been finalized or not. If you cannot select "Finalize" in step 3 above, the disc has already been finalized.

Notes
- Depending on the condition of the disc, recording, or the DVD equipment, discs may not play even if the discs are finalized.
- The recorder may not be able to finalize the disc if it was recorded on another recorder.

Unfinalizing a disc

-RW VR -RW Video

For DVD-RWs (Video mode)
DVD-RWs (Video mode) that have been finalized to prohibit additional recording or editing can be unfinalized to allow further recording or editing.

For DVD-RWs (VR mode)
If you cannot record or edit on a DVD-RW (VR mode) that has been finalized with other DVD equipment, unfinalize the disc.

Note
The recorder is not able to unfinalize DVD-RWs (Video mode) that have been finalized on another recorder.

1 **Insert a disc.**
See "1. Inserting a Disc" on page 27.

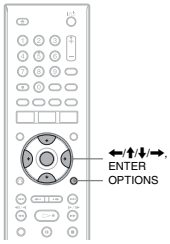
2 **Press OPTIONS to select "Disc Information," and press ENTER.**
The "Disc Information" display appears.

3 **Select "Unfinalize," and press ENTER.**
The recorder starts unfinalizing the disc.
Unfinalizing may take several minutes.

8. Reformatting a disc

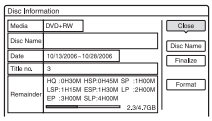
+RW -RW VR -RW Video

New discs are automatically formatted when inserted. If necessary, you can manually re-format a DVD+RW or DVD-RW disc to make a blank disc. For DVD-RWs, you can select a recording format (VR mode or Video mode) according to your needs (page 59).



1 **Insert a disc.**
See "1. Inserting a Disc" on page 27.

2 **Press OPTIONS to select "Disc Information," and press ENTER.**
Example: When a DVD+RW is inserted.



3 **Select "Format," and press ENTER.**

4 **Select "OK," and press ENTER.**
For DVD-RWs and unrecorded DVD-Rs (Video mode), select "VR" or "Video," and press ENTER.
All contents on the disc are erased.

➡continued

Hint
By reformatting, you can change the recording format on DVD-RWs, or record again on DVD-RWs that have been finalized.

Note
On this model, 1 GB (read "gigabyte") is equivalent to 1 billion bytes. The larger the number, the larger the disc space.

Timer Recording

Before Recording

Before you start recording…
- Check that the disc has enough available space for the recording (page 32). For DVD+RWs and DVD-RWs, you can free up disc space by erasing titles (page 59).
- Adjust the recording picture quality and picture size if necessary (page 42).

Hint
Timer recordings will be made regardless whether or not the recorder is turned on. You can turn off the recorder without affecting the recording even after recording starts.

Note
To play a recorded disc on other DVD equipment, finalize the disc (page 35).

Recording mode

Like the standard ×3 recording modes of video tapes, you can select the desired recording mode using the REC MODE button.
Recording modes with higher quality provide a more beautiful recording, but the large data volume also results in a shorter recording time.
Conversely, a longer duration provides a longer recording time, but the lower data volume results in a coarser picture quality.

Press REC MODE repeatedly to switch the recording modes.

Recording mode		Approx. recording time (hours)	
		DVD	DVD+R DL
HQ (High quality)		1	1 hr. 48 min.
HSP	↑	1 hr. 30 min.	2 hr. 42 min.
SP (Standard mode)		2	3 hr. 37 min.
LSP	↓	2 hr. 30 min.	4 hr. 31 min.
ESP	↓	3	5 hr. 25 min.
LP	↓	4	7 hr. 14 min.
EP	↓	6	10 hr. 51 min.
SLP (Long duration)		8	14 hr. 28 min.

Notes
- The maximum continuous recording time for a single title is eight hours.
- Situations below may cause slight inaccuracies with the recording time.
  – Recording a program with poor reception, or a program or video source of low picture quality
  – Recording on a disc that has already been edited
  – Recording only a still picture or just sound

➡continued

Recording a stereo/SAP program

The recorder can receive and record stereo/SAP programs.

Recording stereo programs

If there is noise in the stereo program, set "Auto Stereo" in the "Audio" setup to "Off" (page 76). The sound will be recorded in monaural but with less noise.

SAP (Second Audio Program)

When a SAP (Second Audio Program) is received, the "SAP" indicator lights up on the front panel display. To record only SAP sound, set "Tuner Audio" in the "Audio" setup to "SAP" (page 76).

Unrecordable pictures

Pictures with copy protection cannot be recorded on this recorder.
When the recorder receives a copy guard signal, the recorder continues to record but only a blank, grey colored screen will be recorded.

Copy control signals	Recordable discs
Copy-Free	+RW -RWVR -RWVideo +R -RVR -RVideo
Copy-Once	-RWVR (CPRM*) -RVR (CPRM*)
Copy-Never	None (a blank screen is recorded)

* The recorded disc can be played only on CPRM compatible equipment (page 8).

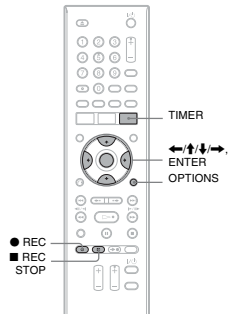
Timer Recording

+RW -RWVR -RWVideo +R -RVR -RVideo

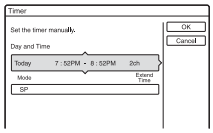
You can set the timer for a total of 40 programs, up to 30 days in advance. Set the date, time, and channel of the program manually.

Note

Do not operate your cable box or satellite receiver just before or during a timer recording. This may prevent the accurate recording of a program.



1 Press TIMER.



2 Press ↑/↓ to select the "Day and Time" or "Mode" row. Then press ENTER.

3 Select an item using ←/→ and adjust using ↑/↓. Then press ENTER.

To make additional changes to items in different rows, return to step 2. The adjustable items are listed below.
"Day and Time":
Sets the date, start time, and stop time, and selects the channel or input source. The date item changes as follows:
Today ⟷ …… ⟷ Sat 12/2 (30 days later) ⟷ Sun (every Sunday) ⟷ …… ⟷ Sat (every Saturday) ⟷ Mon - Fri (Monday to Friday) ⟷ Mon - Sat (Monday to Saturday) ⟷ Daily ⟷ Today
"Mode":
Selects the recording mode (page 39).
"Extend Time":
Sets the duration in increments of 10 minutes, for a maximum of 60 minutes when a timer recording is in progress. If the program set to be recorded daily or weekly is extended, the manually extended time set here will be added to the subsequent timer recording times.
• If you make a mistake, select the item and change the setting.

4 Select "OK," and press ENTER.

The "TIMER LIST" display (page 44) appears. The TIMER REC indicator lights up on the front panel and the recorder is ready to start recording. Unlike a VCR, there is no need to turn off the recorder before the timer recording starts.

To stop recording during timer recording

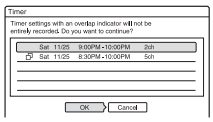
Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

Rec Mode Adjust

If there is not enough available disc space for the recording, the recorder automatically adjusts the recording mode to enable the entire program to be recorded. Set "Rec Mode Adjust" of the "Timer Settings" to "On" in the "Recording" setup (page 78).

If the timer settings overlap

Overlapped timer settings are shown as follows.


Timer
Timer settings with an overlap indicator will not be entirely recorded. Do you want to continue?
Sat 11/25 9:00PM - 10:00PM 2ch
Sat 11/25 8:30PM - 10:00PM 5ch
OK
Cancel

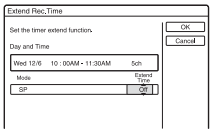
To store the setting as shown, select "OK." The program that does not have a ⧉ mark next to it has priority and the overlapped programs start recording only after the first program has finished.
To cancel the overlapped setting, select "Cancel."

To confirm, change, or cancel a timer recording

See "Checking/Changing/Canceling Timer Settings (Timer List)" on page 44.

To extend the recording duration time while recording

1 Press OPTIONS during recording to select "Extend Rec Time," and press ENTER.



2 Press ↑/↓ to select the duration time. You can set the duration in increments of 10 minutes, for a maximum of 60 minutes.

3 Select "OK" and press ENTER.

Hint

If you are recording to a DVD-RW (VR mode) at a recording mode that is SP or lower and is a 2x speed or higher disc, you can play the title as it is being recorded by selecting the program title on the Title List (page 53).

→continued

Notes

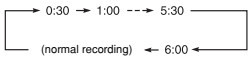
- If a message indicating that the disc is full appears on the screen, change the disc, or make available space for the recording (DVD+RW/DVD-RW only) (page 60).
- Check that the clock is correctly set before setting the timer recording. If not, the timer recording cannot be made.
- To record a satellite program, turn on the satellite tuner and select the satellite program you want to record. Leave the satellite tuner turned on until the recorder finishes recording. If you connect equipment with a timer function, you can use the Synchro Rec function (page 47).
- Even if the timer is set for the same daily or weekly program, the timer recording cannot be made if it overlaps with a program that has priority. "⧉" will appear next to the overlapped setting in the Timer List. Check the priority order of the settings.
- Even if the timer is set, timer recordings cannot be made while recording a program that has priority.
- The Rec Mode Adjust function only works with a timer recording. It does not function with Quick Timer or Synchro Rec.

Using the Quick Timer function

You can set the recorder to record in 30 minute increments.

Press ● REC repeatedly to set the duration.

Each press advances the time in 30 minute increments. The maximum duration is six hours.



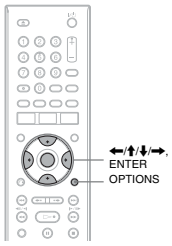
The time counter decreases minute by minute to 0:00, then the recorder stops recording (the power does not turn off). Even if you turn off the recorder during recording, the recorder continues to record until the time counter runs out.

To cancel the Quick Timer

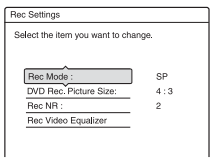
Press ● REC repeatedly until the counter appears in the front panel display. The recorder returns to normal recording mode.

Adjusting the recording picture quality and size

You can adjust the recording picture quality and picture size.



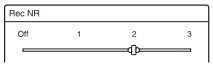
1 Before recording starts, press OPTIONS to select "Rec Settings," and press ENTER.



2 Select the item you want to adjust, and press ENTER.

The adjustment display appears.

Example: Rec NR



"Rec Mode":
Selects the recording mode for the desired recording time and picture quality. For more information, see "Recording mode" on page 39.

"DVD Rec. Picture Size":
Sets the picture size of the program to be recorded.
• 4:3 (default): Sets the picture size to 4:3.
• 16:9: Sets the picture size to 16:9 (wide mode).
"DVD Rec. Picture Size" works with DVD-RWs/DVD-Rs (Video mode) when the recording mode is set to HQ, HSP, SP, LSP, or ESP. For all other recording modes, the screen size is fixed at "4:3."
For DVD-Rs/DVD-RWs (VR mode), the actual picture size is recorded regardless of the setting. For example, if a 16:9 size picture is received, the disc records the picture as 16:9 even if "DVD Rec. Picture Size" is set to "4:3."
For DVD+RWs/DVD+Rs, the screen size is fixed at "4:3."

"Rec NR" (noise reduction): Reduces noise contained in the video signal.

"Rec Video Equalizer": Adjusts the picture in greater detail.
Press ↑/↓ to select the item you want to adjust, then press ENTER.
• Contrast: Changes the contrast.
• Brightness: Changes the overall brightness.
• Color: Makes the colors deeper or lighter.
• Hue: Changes the color balance.

3 Adjust the setting using ←/↑/↓/→, and press ENTER.

The default setting is underlined.
"Rec NR": (weak) Off 1 ~ 2 ~ 3 (strong)
"Rec Video Equalizer":
• Contrast: (weak) –3 ~ 0 ~ 3 (strong)
• Brightness: (dark) –3 ~ 0 ~ 3 (bright)
• Color: (light) –3 ~ 0 ~ 3 (deep)
• Hue: (red) –3 ~ 0 ~ 3 (green)
Repeat steps 2 and 3 to adjust any other items.

Notes

- When playing a 16:9 size picture recorded as 4:3, the image is fixed to 4:3 Letter Box regardless of the setting in "TV Type" of "Video" setup (page 74).
- Remnants of images may appear on your screen when using "Rec NR."
- "Rec Video Equalizer" does not affect the input of the DV IN jack.

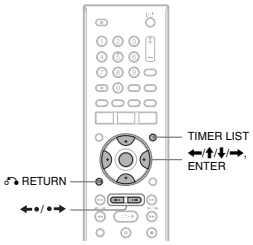
Creating chapters in a title

The recorder can automatically divide a recording (a title) into chapters by inserting chapter marks at approximately 6 minute intervals during recording. To disable this function, set "Auto Chapter" in the "Recording" setup to "Off" (page 78).
When recording to a DVD-R (VR mode) or DVD-RW (VR mode), you can insert and erase chapter marks manually (page 62).

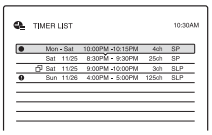
Checking/Changing/Canceling Timer Settings (Timer List)

+RW -RWVR -RWVideo +R -RVR -RVideo

You can check, change, or cancel timer settings using the Timer List.



1 Press TIMER LIST.
The Timer List appears.

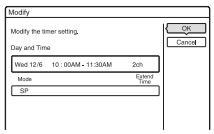

TIMER LIST
10:30AM
Mon - Sat 10:00PM - 10:15PM 4ch SP
Sat 11/25 8:30PM - 9:30PM 25ch SP
Sat 11/25 9:00PM - 10:00PM 3ch SLP
Sun 11/26 4:00PM - 5:00PM 125ch SLP

Timer information displays the recording date, time, recording mode, etc.
🗗:
Indicates that the setting is overlapped by another setting.
● (red):
Indicates the setting is currently being recorded.
❗:
Indicates that the timer recording cannot be recorded as set, such as for a timer recording that cannot be recorded in the selected Rec mode.

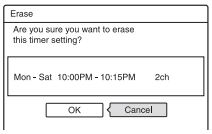
When all of the timer settings do not fit on the list, the scroll bar appears.
To view the hidden timer settings, press ↑/↓.

2 Select the timer setting you want to check/change/cancel, and press ENTER.
The sub-menu appears.

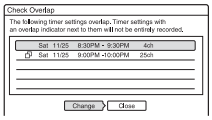
3 Select one of the options, and press ENTER.
"Modify":
Changes the timer setting.
Select an item using ←/→ and adjust using ↑/↓. Select "OK," and press ENTER.



"Erase":
Erases the timer setting. Select "OK," and press ENTER.



"Check Overlap":
Checks for overlapped settings.
The timer setting without the 🗗 mark has priority over the other settings.


Check Overlap
The following timer settings overlap. Timer settings with an overlap indicator next to them will not be entirely recorded.
Sat 11/25 8:30PM - 9:30PM 4ch
Sat 11/25 9:00PM - 10:00PM 25ch
Change
Close

To change the priority of a program, press ←/→ to select "Change." For details, see "Changing the priority of overlapped settings" on page 45.

Select "Close" to return to the Timer List. To change or cancel the setting, repeat steps 2 and 3 above.

To scroll the list display by page (Page mode)

Press ←● REPLAY/ADVANCE ●→ while the list display is turned on. Each time you press ←● REPLAY/ADVANCE ●→, the entire Timer List changes to the next/previous page of timer settings.

To turn off the Timer List

Press TIMER LIST or ↩ RETURN.

Hint

While recording, you cannot modify the timer setting for the current recording, but you can extend the duration of the recording time (page 41).

Notes

- Even if the timer is set, timer recordings cannot be made while recording a program that has priority.
- Even if the timer is set for the same daily or weekly program, the timer recording cannot be made if it overlaps with a program that has priority. "🗗" will appear next to the overlapped setting in the Timer List. Check the priority order of the settings.

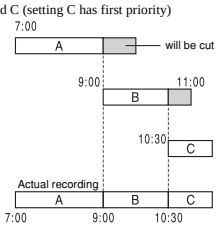
Changing the priority of overlapped settings

If the timer settings overlap, the program that was set last has priority and will be recorded. A timer recording of lower priority may be canceled, start from the middle or stop midway through the program.
You can change the priority of a program if necessary.

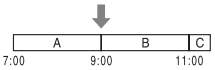
When the timer settings overlap

The program set last has priority.

Example: You set the timer in order of A, B, and C (setting C has first priority)

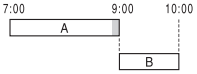


If you give setting B priority over setting C, all of program B will be recorded and program C is recorded only after program B has ended.



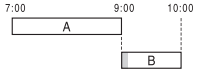
If the end time of one recording and the start time of another are the same

If program B has priority, the end of program A will be cut off.

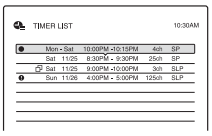


➡continued

If program A has priority, recording of program B may be delayed.

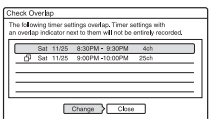


1 Press TIMER LIST.
The Timer List appears.

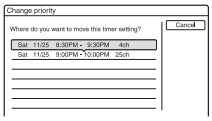

TIMER LIST
10:30AM
Mon - Sat 10:00PM - 10:15PM 4ch SP
Sat 11/25 8:30PM - 9:30PM 25ch SP
Sat 11/25 9:00PM - 10:00PM 3ch SLP
Sun 11/26 4:00PM - 5:00PM 125ch SLP

2 Select an overlapped timer setting, and press ENTER.
🗗 indicates that the timer setting is overlapped by another timer setting.

3 Select "Check Overlap," and press ENTER.


Check Overlap
The following timer settings overlap. Timer settings with an overlap indicator next to them will not be entirely recorded.
Sat 11/25 8:30PM - 9:30PM 4ch
Sat 11/25 9:00PM - 10:00PM 25ch
Change
Close

4 Select "Change," and press ENTER.



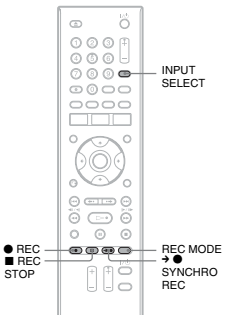
5 Press ↑/↓ to change the timer setting's priority, and press ENTER.
The setting moves to its new location in the list. A timer setting higher up in the list has higher priority.
To return to the Timer List, select "Cancel."

Hint

You can change the priority of a timer setting while recording.

Recording From Connected Equipment

+RW -RWVR -RWVideo +R -RVR -RVideo



Recording from connected equipment with a timer (Synchro Rec)

You can set the recorder to automatically record programs from connected equipment that has a timer function (such as a satellite tuner). Connect the equipment to the LINE 1 IN jacks of the recorder (page 26).
When the connected equipment turns on, the recorder starts recording a program from the LINE 1 IN jacks.

1 Insert a recordable DVD.
See "1. Inserting a Disc" on page 27.

2 Press INPUT SELECT repeatedly to select "L1."

3 Press REC MODE repeatedly to select the recording mode.
For details about the recording mode, see page 39.

4 Set the timer on the connected equipment to the time of the program you want to record, and turn it off.

5 Press → ● SYNCHRO REC.
The SYNCHRO REC indicator lights up on the front panel. The recorder is ready to start Synchro-Recording.
The recorder automatically starts recording when it receives an input signal from the connected equipment. The recorder stops recording when the connected equipment turns off.

To stop recording

Press ■ REC STOP or → ● SYNCHRO REC.

To cancel Synchro Rec

Press → ● SYNCHRO REC.
The SYNCHRO REC indicator on the recorder turns off.

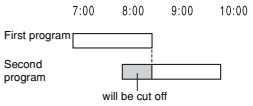
Notes

- The recorder starts recording only after detecting a video signal from the connected equipment. The beginning of the program may not be recorded regardless of whether or not the recorder's power is on or off.
- During Synchro-Recording, other operations, such as normal recording, cannot be performed.
- To use the connected equipment while the recorder is standing by for Synchro-Recording, cancel Synchro-Recording by pressing → ● SYNCHRO REC. Be sure to turn off the connected equipment and press → ● SYNCHRO REC to reset Synchro-Recording before the timer recording starts.
- The Synchro Rec function does not work with some tuners. For details, see the tuner's operating instructions.
- While the recorder is standing by for Synchro-Recording, the Auto Clock Set function (page 72) does not work.
- To use the Synchro Rec function, you must first set the recorder's clock correctly.

➡continued

If the timer settings of a Synchro-Recording and another timer recording overlap

Regardless of whether or not the program is a Synchro Rec program, the program that starts first has priority and the second program starts recording only after the first program has finished.

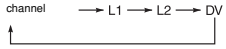


Recording from connected equipment without a timer

You can record from a connected VCR or similar device. To connect a VCR or similar device, see "Connecting a VCR or Similar Device" on page 24. Use the DV IN jack on the front panel if the equipment has a DV output jack (i.LINK jack).

1 Insert a recordable DVD.
See "1. Inserting a Disc" on page 27.

2 Press INPUT SELECT to select an input source according to the connection you made.
The front panel display changes as follows:



3 Press REC MODE repeatedly to select the recording mode.
For details about the recording mode, see page 39.

4 Insert the source tape into the connected equipment and set to playback pause.

5 Press ● REC.
This recorder starts recording.

6 Press the pause (or play) button on the connected equipment to cancel the playback pause status.
The connected equipment starts playback and the playback image is recorded by this recorder.
To stop recording, press ■ REC STOP on this recorder.

If you connect a digital video camera with a DV IN jack

See "DV/Digital8 Dubbing" on page 66 for an explanation of how to record from the DV IN jack.

Hint

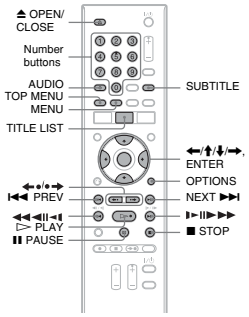
You can adjust the settings for the recording picture before recording. See "Adjusting the recording picture quality and size" on page 42.

Notes

- When recording a video game image, the screen may not be clear.
- Any program that contains a Copy-Never copy guard signal cannot be recorded. The recorder continues to record, but a blank screen will be recorded.

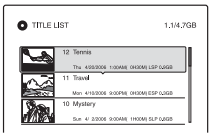
Playing

+RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD



1 Insert a disc.
- See "1. Inserting a Disc" on page 27.
- If you insert a DVD VIDEO, VIDEO CD, CD, DATA DVD, or DATA CD, press ▷ PLAY. Playback starts.

2 Press TITLE LIST.
For details about the Title List, see "3. Playing the Recorded Program (Title List)" on page 28.
Example: DVD+RW



3 Select the title, and press ENTER.
The sub-menu appears.

4 Select "Play," and press ENTER.
Playback starts from the selected title.

To use the DVD's Menu

When you play a DVD VIDEO, or a finalized DVD+RW, DVD-RW (Video mode), DVD+R, or DVD-R (Video mode), you can display the disc's menu by pressing TOP MENU or MENU.

To play VIDEO CDs with PBC functions

PBC (Playback Control) allows you to play VIDEO CDs interactively using the menu on your TV screen.
When you start playing a VIDEO CD with PBC functions, the menu appears.
Select an item using the number buttons and press ENTER. Then, follow the instructions in the menu (press ▷ PLAY when "Press SELECT" appears).
The PBC function of Super VIDEO CDs does not work with this recorder. Super VIDEO CDs are played in continuous play mode only.

To change the angles

If various angles (multi-angles) for a scene are recorded on the disc, "" appears in the front panel display. Press OPTIONS during playback to select "Change Angle," and press ENTER.

To stop playback

Press ■ STOP.

To resume playback from the point where you stopped (Resume Play)

When you press ▷ PLAY again after you stop playback, the recorder resumes playback from the point where you pressed ■ STOP. To start from the beginning, press OPTIONS to select "Play Beginning," and press ENTER. Playback starts from the beginning of the title/track/scene.

The point where you stopped playing is cleared when:
– you open the disc tray.
– you play another title.
– you switch the Title List menu to Original or Playlist (DVD-RWs/DVD-Rs in VR mode only).
– you edit the title after stopping playback.
– you change the settings on the recorder.
– you turn off the recorder (VIDEO CD/CD/DATA DVD/DATA CD only).
– you make a recording (except for DVD-RWs/DVD-Rs in VR mode).
– you disconnect the AC power cord.

To play restricted DVDs (Parental Control)

If you play a restricted DVD, the message "Do you want to temporarily change the Parental Control level to *?" appears on your TV screen.

1 Select "OK" and press ENTER.
The display for entering your password appears.

2 Enter your four-digit password using the number buttons.

3 Press ENTER to select "OK."
The recorder starts playback.

To register or change the password, see "Parental Control (DVD VIDEO only)" on page 79.

To lock the disc tray (Child Lock)

You can lock the disc tray to prevent children from ejecting the disc.
When the recorder is turned on, hold down ■ STOP until "LOCKED" appears in the front panel display. The ⏏ OPEN/CLOSE button does not work while the Child Lock is set.

To unlock the disc tray, hold down ■ STOP until "UNLOCKED" appears in the front panel display when the recorder is turned on.

Hints

- You can also use the ▷ PLAY button in step 3 (page 49) to start playback.
- Even if you select "Factory Setup" in the "Others" setup (page 81), the Child Lock remains set.

Playback options

To check the position of the buttons below, see the illustration on page 49.
For MP3 or JPEG operations, see "Playing MP3 Audio Tracks or JPEG Image Files" on page 55.

Buttons	Operations
AUDIO -RWVR -RVR DVD VCD CD	Selects one of the audio tracks recorded on the disc when pressed repeatedly in normal playback mode. DVD : Selects the language. -RWVR -RVR : Selects the main or sub sound. VCD CD : Selects stereo or monaural audio tracks.
SUBTITLE DVD	Selects a subtitle language when pressed repeatedly.
◂◂ REPLAY/ ADVANCE ▸▸ (instant replay/instant advance) +RW -RWVR -RWVideo +R -RVR -RVideo DVD	Replays the scene/briefly fast forwards the scene.
⏮ PREV/NEXT ⏭	Goes to the beginning of the previous/next title/chapter/scene/track.
◀◀ ◀II ◂▮/▮▸ II▶ ▶▶ (fast reverse/fast forward)	Fast reverses/fast forwards the disc when pressed during playback. Search speed changes as follows: fast reverse ◀◀1 ← ◀◀2 ← ◀◀3* ← fast forward → 1▶▶ → 2▶▶ → 3▶▶* When you press and hold the button, fast forward/fast reverse continues at the selected speed until you release the button. * ◀◀3 and 3▶▶ are only available for DVDs.
◀◀ ◀II ◂▮/▮▸ II▶ ▶▶ (slow, freeze frame) +RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD * * Playback direction only	Plays in slow motion when pressed for more than one second in pause mode. Plays one frame at a time when pressed briefly in pause mode.
II PAUSE	Pauses playback.

To resume normal playback, press ▷ PLAY.

Notes

- Angles and subtitles cannot be changed with titles recorded on this recorder.
- Slideshows made with a DVD camcorder can only be played. Other play functions, such as fast forward, cannot be used.

Notes on playing DTS sound tracks on a CD

- When playing DTS-encoded CDs, excessive noise will be heard from the analog stereo jacks. To avoid possible damage to the audio system, the consumer should take proper precautions when the analog stereo jacks of the recorder are connected to an amplification system. To enjoy DTS Digital Surround™ playback, an external DTS decoder must be connected to the DIGITAL OUT jack of the recorder.
- Set the sound to "Stereo" using the AUDIO button when you play DTS sound tracks on a CD (page 51).

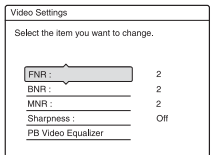
Notes on playing DVDs with a DTS sound track

DTS audio signals are output only through the DIGITAL OUT (COAXIAL) jack.
When you play a DVD with DTS sound tracks, set "DTS" to "On" in the "Audio" setup (page 76).

Adjusting the picture quality

+RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD

1 Press OPTIONS during playback to select "Video Settings," and press ENTER.



2 Select an item, and press ENTER.
The adjustment display appears.
"FNR" (frame noise reduction):
Reduces noise contained in the luminance element of the video signal.
"BNR" (block noise reduction):
Reduces "block noise" or mosaic like patterns in the picture.
"MNR" (mosquito noise reduction):
Reduces the faint noise appearing around the outlines of the images. The noise reduction effects are automatically adjusted within each setting range according to the video bit rate and other factors.
"Sharpness":
Sharpens the outlines of the images.
"PB Video Equalizer" (Playback video equalizer):
Adjusts the picture in greater detail.
Select an item and press ENTER.
- Contrast: changes the contrast.
- Brightness: changes the overall brightness.
- Color: makes the colors deeper or lighter.
- Hue: changes the color balance.

3 Press ←/→ to adjust the setting, and press ENTER.
The default settings are underlined.
"FNR": (weak) Off 1 2 3 (strong)
"BNR": (weak) Off 1 2 3 (strong)
"MNR": (weak) Off 1 2 3 (strong)
"Sharpness"*: (weak) Off 1 2 3 (strong)
"PB Video Equalizer":
- Contrast: (weak) –3 ~ 0 ~ 3 (strong)
- Brightness: (dark) –3 ~ 0 ~ 3 (bright)
- Color: (light) –3 ~ 0 ~ 3 (deep)
- Hue: (red) –3 ~ 0 ~ 3 (green)

Repeat steps 2 and 3 to adjust any other items.
* "1" softens the outlines of the images. "2" enhances the outlines and "3" enhances them more than "2."

Notes

- If the outlines of the images on your screen become blurred, set "BNR" and/or "MNR" to "Off."
- Depending on the disc or the scene being played, the above BNR, MNR, or FNR effects may be hard to discern. And, these functions may not work with some screen sizes.
- When using the "Sharpness" function, noise found in the title may become more apparent. In this case, it is recommended that you use the BNR function with the "Sharpness" function. If the condition still does not improve, set the "Sharpness" level to "Off."

Adjusting the delay between the picture and sound (AV SYNC)

+RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD

1 Press OPTIONS during playback to select "Audio Settings," and press ENTER.

2 Select "AV SYNC", and press ENTER.
"AV SYNC":
When the video is delayed, this function delays the audio for synchronization with the video (0 to 120 milliseconds). Larger numbers indicate a longer audio delay for synchronization with the video. When dubbing to a VCR or other video recording equipment, be sure to return this setting to 0 ms (default).

3 Press ←/→ to adjust the setting, and press ENTER.

Playing from the beginning of the program you are recording (Chasing Playback)

-RWVR

"Chasing Playback" allows you to view the recorded part of a program while the recording is being made. You do not need to wait until the recording finishes.

Press OPTIONS while recording to select "Chasing Playback," and press ENTER.
Playback starts from the beginning of the program you are recording.
When you fast forward to the point that you are recording, Chasing Playback returns to normal playback.

Notes

- For DVD-RWs (VR mode), this function does not work when recording:
  – on a 1x-speed DVD-RW.
  – in the HQ or HSP recording mode.
- The DVD's picture on your TV screen freezes for a few seconds when you fast forward/fast reverse or instant replay/advance the recording.
- Chasing Playback is possible from one minute or more after recording starts.
- Even if you fast forward the recorded program, there will always be a time difference of about one minute or more between the recorded program and the current TV broadcast.

→continued

Playing a previous recording while making another (Simultaneous Rec and Play)

-RWVR

You can play a previously recorded program while recording another on the same disc. Playback continues even if the recording is a timer recording.

1 While recording, press TITLE LIST.
The Title List appears.

2 Select the title you want to play, and press ENTER.
The sub-menu appears.

3 Select "Play", and press ENTER.
Playback starts from the selected title.

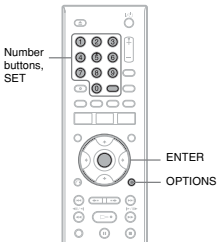
Notes

- This function does not work when recording:
  – on a 1x-speed DVD-RW.
  – in the HQ or HSP recording mode.
- When playing a title recorded in the HQ or HSP recording mode, picture noise may appear depending upon the condition of the recording.
- Picture noise may appear depending upon the condition of the recording, or when playing a title recorded in the HQ or HSP recording mode. The picture freezes for a few seconds when you use fast forward/fast reverse or instant replay/advance.

Searching for a Title/ Chapter/Track, etc.

+RW -RWVR -RWVideo +R -RVR -RVideo DVD VCD CD DATA DVD DATA CD

You can search a disc by title, chapter, scene or track. As titles and tracks are assigned individual numbers, select the title or track by entering its number. You can also search for a scene using the time code.



1 Press OPTIONS during playback to select a search method, and press ENTER.
"Title Search" (for DVDs)
"Chapter Search" (for DVDs)
"Track Search" (for CDs/DATA CDs)
"Search" (for VIDEO CDs)
"Album Search" (for DATA DVDs/ DATA CDs)
"Time Search" (for DVDs): Searches for a starting point by entering the time code.
"File Search" (for DATA DVDs/DATA CDs)

The display for entering the number appears.
Example: Title Search

The number in parentheses indicates the total number of titles, tracks, etc.

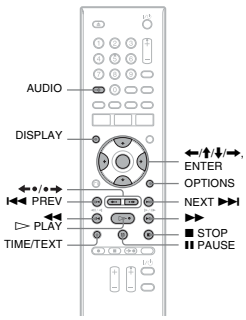
2 Press the number buttons to select the number of the title, chapter, track, time code, etc., you want.
For example: Time Search
To find a scene at 2 hours, 10 minutes, and 20 seconds, enter "21020."
If you make a mistake, select another number.

3 Press ENTER or SET.
The recorder starts playback from the selected number.

Playing MP3 Audio Tracks or JPEG Image Files

DATA DVD DATA CD

You can play MP3 audio tracks and JPEG image files on DATA CDs (CD-ROMs/CD-Rs/CD-RWs) or JPEG image files on DATA DVDs (DVD-ROMs/DVD+RWs/DVD+Rs/ DVD-RWs/DVD-Rs).



1 Insert a disc.
See "1. Inserting a Disc" on page 27.

2 Press ▷ PLAY.
For MP3 discs, playback starts from the first MP3 audio track on the disc.
For JPEG files, a slideshow of the pictures on the disc begins.
If the disc contains MP3 audio tracks and JPEG image files, only the JPEG image files are played back when ▷ PLAY is pressed.

To stop playback or slideshow
Press ■ STOP.

To pause playback or slideshow
Press ❚❚ PAUSE.

→continued

To play the beginning of the track

Press OPTIONS to select “Play Beginning,” and press ENTER.

To fast forward or review a track

Press ◀◀/▶▶ during playback.

To go to the next or previous MP3 audio track or JPEG image file

Press I◀◀ PREV or NEXT ▶▶I during playback. If you repeatedly press I◀◀ PREV or NEXT ▶▶I, you will go to the next or previous album. (MP3 audio track only)

To go to the next or previous album

Press ←• REPLAY/ADVANCE •→ during playback or slideshow.

To rotate a picture

Press OPTIONS while the JPEG image is displayed to select “Rotate Right” or “Rotate Left,” and press ENTER.

Hints

- Press the AUDIO button to switch between stereo or monaural audio tracks.
- You can rotate a JPEG image by using the ←/→ buttons when the image is displayed.
- Press DISPLAY repeatedly to show information about the JPEG album or image on your TV screen. Then press TIME/TEXT to toggle between the current selected image number and album number.

Notes

- Some JPEG files, especially files of three million pixels or more, may lengthen the slideshow interval.
- Rotated JPEG images will not be saved when you switch to another folder.
- Images larger than 720 × 480 will be reduced to 720 × 480 when displayed.
- The following images are not displayed:
  – progressive JPEG image files
  – grayscale JPEG image files
  – 4:1:1 JPEG image files
- When you attempt to play a broken file or a file that does not satisfy the play conditions, appears but the recorder cannot play the file.

About MP3 audio tracks and JPEG image files

MP3 is an audio compression technology that satisfies certain ISO/MPEG regulations.
JPEG is an image compression technology.
You can play MP3 (MPEG1 Audio Layer 3) format audio tracks and JPEG image files on DATA CDs (CD-ROMs/CD-Rs/CD-RWs) or JPEG image files on DATA DVDs (DVD-ROMs/DVD+RWs/DVD+Rs/DVD-RWs/DVD-Rs).
DATA CDs must be recorded according to ISO9660 Level 1, Level 2 or Joliet format for the recorder to recognize the MP3 tracks.
You can also play discs recorded in MultiSession/Border.
See the instructions supplied with the disc drives and the recording software (not supplied) for details on the recording format.

Note on MultiSession/Border discs

If audio tracks and images in Music CD format or Video CD format are recorded in the first session/border, only the first session/border will be played back.

Note

The recorder may not be able to play some DATA CDs created in the Packet Write format.

MP3 audio tracks or JPEG image files that the recorder can play

The recorder can play the following tracks and files:
– MP3 audio tracks with the extension “.mp3.”
– JPEG image files with the extension “.jpeg” or “.jpg.”
– JPEG image files that conform to the DCF* image file format.

* “Design rule for Camera File system”: Image standards for digital cameras regulated by JEITA (Japan Electronics and Information Technology Industries Association).

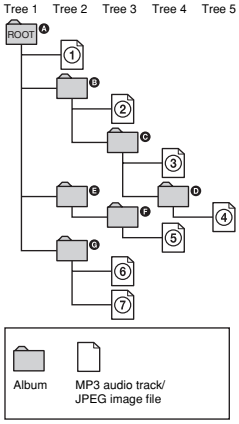
Notes

- The recorder will play any data with the extension “.mp3,” “.jpeg,” or “.jpg,” even if they are not in MP3 or JPEG format. Playing these data may generate a loud noise which could damage your speaker system.
- The recorder does not conform to audio tracks in mp3PRO format.
- Some files cannot be played.
- The letters that cannot be displayed are replaced with “*.”

About playback order of albums, tracks, and files

Albums play in the following order:

Structure of disc contents



When you insert a DATA CD/DATA DVD and press ▷ PLAY, the numbered tracks (or files) are played sequentially, from ① through ⑦. For JPEG image files, press ADVANCE •→ to go to the next album. (For instance, when you want to go from ① to ②.) Any sub-albums/tracks (or files) contained within a currently selected album take priority over the next album in the same tree. (Example: Ⓒ contains Ⓓ so ④ is played before ⑤.)

Hints

- If you add numbers (01, 02, 03, etc.) to the front of the track/file names when you store the tracks (or files) in a disc, the tracks and files will be played in that order.
- Since a disc with many trees takes longer to start playback, it is recommended that you create albums with no more than two trees.

continued

Notes

- Depending on the software you use to create the DATA DVD/DATA CD, the playback order may differ from the above illustration.
- No more than a total of 999 individual folders can be played. (Folders that do not contain JPEG/MP3 files are counted as well.)
- No more than a total of 999 folders and 9999 files can be played. (Files other than JPEG/MP3 files, and folders that do not contain JPEG/MP3 files are counted as well.)
- No more than 999 folders and files can be recognized in a single folder. (Folders that do not contain JPEG/MP3 files are counted as well.)
- Proceeding to the next or another album may take some time.
- This recorder supports MP3 audio bit rates up to 320 kbps.

Erasing and Editing

Before Editing

This recorder offers various edit options for various disc types.

Notes

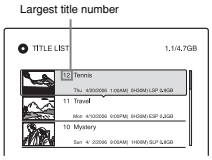
- You may lose the edited contents if you remove the disc or a timer recording starts while editing.
- DVD discs created by DVD video cameras cannot be edited on this recorder.
- If a message appears and indicates that the disc’s control information is full, erase or edit unnecessary titles.
- When editing a DVD+R or DVD-R, finish all editing before finalizing the disc. You cannot edit a finalized disc.

Edit features	-RWVR / -RVR Original title	-RWVR / -RVR Playlist title	+RW / -RWVideo / +R / -RVideo
Erase (page 60)	Yes	Yes	Yes
Protect Title (page 60)	Yes	No	Yes
Title Name (page 60)	Yes	Yes	Yes
A-B Erase (page 61)	Yes	Yes	Yes*
Erase Titles (page 60)	Yes	Yes	Yes
Divide Title (page 65)	No	Yes	No
Set Thumbnail (page 60)	Yes	Yes	No
Chapter mark (page 62)	Yes	Yes	No
Playlist creation (page 62)	Yes	Yes	No
Change Order (page 64)	No	Yes	No
Combine Titles (page 64)	No	Yes	No

* DVD+RW only

To open up disc space

To open up disc space on a DVD+RW or DVD-RW (Video mode), erase the title with the largest number in the title list.



For the DVD-RWs (VR mode), you can erase any title.
For DVD-Rs and DVD+Rs, the available disc space does not increase even if you erase titles.
See “Erasing and Editing a Title” on page 60 or “Erasing multiple titles (Erase Titles)” on page 60.

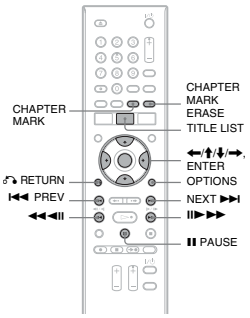
To switch between the Playlist and Original Title List

You can display the Playlist titles in the Title List (Playlist), or the Original titles in the Title List (Original). To switch the two Title Lists, press ←/→ while a Title List is displayed. To create and edit a Playlist, see page 62.

Erasing and Editing a Title

+RW -RWVR -RWVideo +R -RVR -RVideo

This section explains the basic edit functions. Note that editing is irreversible. To edit DVD-RWs/DVD-Rs (VR mode) without changing the original recordings, create a Playlist title (page 62).



1 Press TITLE LIST.
For DVD-RWs/DVD-Rs in VR mode, press ←/→ to switch the Title Lists, if necessary.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select an option, and press ENTER.
You can make the following edits to the title.
"Erase": Erases the selected title. Select "OK" when asked for confirmation.
"Protect Title": Protects the title. "🔒" appears next to the protected title.
"Title Name": Allows you to enter or re-enter a title name (page 33).
"A-B Erase": Erases a section of the title (page 61).
"Set Thumbnail": Changes the title's thumbnail picture that appears in the Title List (page 30).
"Make a Playlist": Adds the entire title to the Playlist title as one scene (page 64).

Hints
- You can erase multiple titles at one time (page 60).
- You can label or re-label DVDs (page 34).

Note
DVD-RW/DVD-R (VR mode) playlist titles cannot be protected.

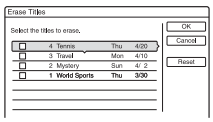
Erasing multiple titles (Erase Titles)

+RW -RWVR -RWVideo +R -RVR -RVideo

You can select and erase more than one title at one time using the OPTIONS menu.

1 Press TITLE LIST.
For DVD-RWs/DVD-Rs in VR mode, press ←/→ to switch the Title Lists, if necessary.

2 Press OPTIONS to select "Erase Titles," and press ENTER.
The display for selecting titles to be erased appears.



3 Select a title, and press ENTER.
A check mark appears in the check box next to the selected title.
- To clear the check mark, press ENTER again.
- To clear all of check marks, select "Reset."

4 Repeat step 3 to select all of the titles you want to erase.

5 When you finish selecting titles, select "OK," and press ENTER.
The list of the titles to be erased appears for confirmation.
- To change the selection, select "Change," and repeat from step 3.

6 Select "OK" and press ENTER.
The titles are erased.

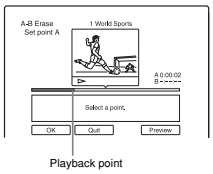
To erase all titles on the disc
You can reformat a DVD+RW or DVD-RW to make the disc blank.
See "8. Reformatting a disc" on page 37.

Erasing a section of a title (A-B Erase)

+RW -RWVR -RVR

You can select a section (scene) in a title and erase it. Note that erasing scenes in a title cannot be undone.

1 After step 2 of "Erasing and Editing a Title," select "A-B Erase" and press ENTER.
The display for setting point A appears. The title starts to play.
- To return to the beginning of the title, press ❚❚ PAUSE and then press ⏮ PREV.



Playback point

2 Select point A using ◀◀/▶▶, and press ENTER.
Playback pauses.

3 Press ENTER if point A is correct.
If point A is incorrect, select point A using ◀❚❚/❚❚▶, and press ENTER. The display for setting point B appears.

4 Select point B using ◀◀/▶▶, and press ENTER.
Playback pauses.

5 Press ENTER if point B is correct.
If point B is incorrect, select point B using ◀❚❚/❚❚▶, and press ENTER. The display asks for confirmation.
- To reset point A, press ↑ and 🔙 RETURN, and go to step 2.
- To reset point B, press ↑ and repeat step 4.
- To preview the title without scenes to be erased, select "Preview" (except for DVD+RWs).

6 Select "OK," and press ENTER.
The scene is erased. The display for setting point A appears.
- To continue, go to step 2.
- To finish, select "Quit."

Hint
A chapter mark is inserted after the scene was erased. The chapter mark divides the title into separate chapters on either side of the mark.

Notes
- Images or sound may be momentarily interrupted at the point where you erase a section of a title.
- Sections shorter than five seconds may not be erased.
- For DVD+RWs, the erased section may be slightly different from the points you selected.

→continued 61

Creating chapters manually

-RWVR -RVR

You can manually insert a chapter mark at any point you like during playback or recording.

Press CHAPTER MARK at the point where you want to divide the title into chapters.
Each time you press the button, "Marking ..." appears on the screen and the scenes to the left and right of the mark become separate chapters.

To erase chapter marks
You can combine two chapters by erasing the chapter mark during playback.
Press ⏮ PREV/NEXT ⏭ to search for a chapter number, and while displaying the chapter containing the chapter mark you want to erase, press CHAPTER MARK ERASE. The current chapter combines with the previous chapter.

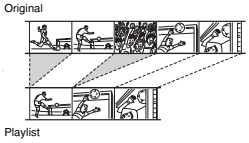
Note
To insert a chapter mark manually during recording, set "Auto Chapter" to "Off" in the "Recording" setup.

Creating and Editing a Playlist

-RWVR -RVR

Playlist edit allows you to edit or re-edit without changing the actual recordings. You can create up to 97 Playlist titles.

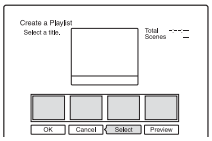
Example: You have recorded the final few matches of a football tournament on a DVD-RW/DVD-R (VR mode). You want to create a digest with the goal scenes and other highlights, but you also want to keep the original recording.



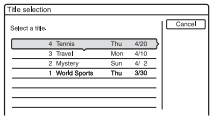
In this case, you can compile highlight scenes as a Playlist title. You can even rearrange the scene order within the Playlist title.
The Playlist title calls up data from the original titles for playback. When an original title is used for a Playlist title, the original title cannot be edited and erased.

1 Press TITLE LIST.
If the Title List (Original) appears, press ←.

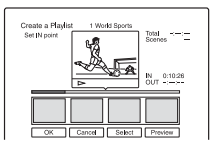
2 Press OPTIONS to select "Create a Playlist," and press ENTER.



3 Select "Select," and press ENTER.



4 Select the title you want to include in the Playlist title, and press ENTER.
The display for setting the start point (IN) appears. The title starts to play.
- To return to the beginning of the title, press ❚❚ PAUSE and then press ⏮ PREV.



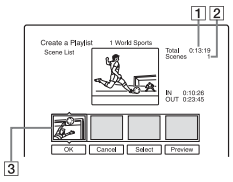
5 Select the IN point using ◀◀/▶▶, and press ENTER.
Playback pauses.

6 Press ENTER if the IN point is correct.
If the IN point is incorrect, select the IN point using ◀❚❚/❚❚▶, and press ENTER. The display for setting the end point (OUT) appears.

7 Select the OUT point using ◀◀/▶▶, and press ENTER.
Playback pauses.

8 Press ENTER if the OUT point is correct.
If the OUT point is incorrect, select the OUT point using ◀❚❚/❚❚▶, and press ENTER.
The selected scene is added to the scene list.
- To add more scenes, go to step 5.

9 When you finish adding scenes, press ↓.



1 Total duration of the selected scene
2 Total number of scenes
3 Selected scene

10 Select the scene you want to re-edit, and press ENTER.
The sub-menu appears.
"Move": Changes the scene order using ←/→ and press ENTER.
"Erase": Erases the scene. When asked for confirmation, select "OK."
- To add more scenes, press ↑ and go to step 5.
- To add more scenes from another title, select "Select" and go to step 4.
- To preview all of the captured scenes in the listed order, select "Preview."

11 When you finish editing the scene list, select "OK," and press ENTER.
The title of the created Playlist is added to the Title List (Playlist). The title name is the title name of the first scene.

Hint
When a Playlist title is created, the IN and OUT points will become chapter marks, and each scene will become a chapter.

Note
The picture may pause when the edited scene is played.

→continued 63

To add the entire title to the Playlist title as one scene (Make a Playlist)

1 Press TITLE LIST. If the Title List (Playlist) appears, press ➡.

2 Select the title and press ENTER.
The sub-menu appears.

3 Select "Make a Playlist," and press ENTER.
The selected title is added to the Title List (Playlist).
The title name is the same as the Original title name.

To play the Playlist title

1 Press TITLE LIST. If the Title List (Original) appears, press ⬅.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select "Play," and press ENTER.

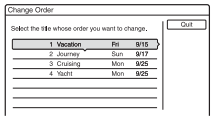
Moving a Playlist title (Change Order)

-RWVR -RVR

You can change the Playlist title order within the Title List (Playlist).

1 Press TITLE LIST.
If the Title List (Original) appears, press ⬅.

2 Press OPTIONS to select "Change Order," and press ENTER.


Change Order
Select the title whose order you want to change.
Quit
1 Vacation Fri 9/15
2 Journey Sun 9/17
3 Cruising Mon 9/25
4 Yacht Mon 9/25

3 Select the title you want to move, and press ENTER.

4 Select a new location for the title using ⬆/⬇, and press ENTER.
The title moves to the new location.
• To move more titles, go to step 3.
• To finish, select "Quit," and press ENTER.

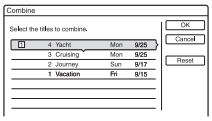
Combining multiple Playlist titles (Combine Titles)

-RWVR -RVR

1 Press TITLE LIST.
If the Title List (Original) menu appears, press ⬅.

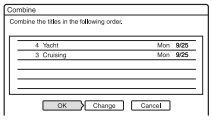
2 Press OPTIONS to select "Combine Titles," and press ENTER.
The display for selecting titles appears.

3 Select a title, and press ENTER.
A number indicating the order in which you selected the title appears.
To cancel the selection, press ENTER again.



4 Repeat step 3 to select all of the titles you want to combine.
To cancel all of the selections, select "Reset."

5 Select "OK," and press ENTER.
The list of titles to be combined appears.
To change the selection, select "Change" and go to step 3.



6 Select "OK," and press ENTER.
The titles are combined.

Hint
After titles are combined, the title name is the title name of the first title prior to combination.

Note
When the number of chapters in the title to be combined exceeds the limit, the chapters at the end are combined into a single chapter.

Dividing a Playlist title (Divide Title)

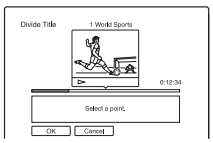
-RWVR -RVR

You can divide a Playlist title.

1 Press TITLE LIST.
If the Title List (Original) appears, press ⬅.

2 Select a title, and press ENTER.
The sub-menu appears.

3 Select "Divide Title," and press ENTER.
The display for setting the dividing point appears, and the title starts to play.
• To return to the beginning of the title, press ❚❚ PAUSE and then press ⏮ PREV.



4 Select the dividing point by pressing ◀◀/▶▶, and press ENTER.
Playback pauses.

5 Press ENTER if the dividing point is correct.
If the dividing point is incorrect, select the dividing point using ◀❚❚/❚❚▶, and press ENTER.
The display asks for confirmation.
• To change the dividing point, press ⬆.

6 Select "OK," and press ENTER.
The title is divided in two.

Hint
After a title is divided, the title name prior to division is assigned to both the first and second parts.

Before DV/Digital8 Dubbing

This section explains dubbing with a digital video camera via the DV IN jack on the front panel. If you want to dub by way of the LINE IN jacks, see "Recording from connected equipment without a timer" on page 48.
The DV IN jack on this recorder conforms to the i.LINK standard.
Follow the instructions in "Preparing for DV/Digital8 dubbing," and then move on to the section on dubbing. For more information about i.LINK, see "About i.LINK" on page 90.

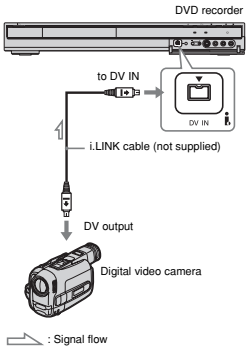
Preparing for DV/Digital8 dubbing

You can connect a digital video camera to the DV IN jack on the recorder to record or edit from a DV/Digital8 format tape. Operation is straightforward because the recorder will fast forward and rewind the tape for you – you do not need to operate your digital video camera. Do the following to start using the "DV/D8 Edit" functions of this recorder.
See the instruction manual supplied with the digital video camera as well before connecting.

Hint
If you plan to do additional editing on a disc after the initial dub, use the DV IN jack and record on a DVD-RW/DVD-R (VR mode).

Notes
• You cannot make a recording while DV dubbing.
• The DV IN jack is for input only. It will not output signals.
• You cannot use the DV IN jack when:
– signal input to the DV IN jack on the front panel or recorder operation cannot be performed correctly when using a digital video camera (see "About i.LINK" on page 90). Connect the camera to the LINE IN jack and follow the instructions of "Recording from connected equipment without a timer" on page 48.
– the input signal is not in DVC-SD format. Do not connect a MICRO MV format digital video camera even if it has an i.LINK jack.
– the images on the tape contain copy protection signals, which limit recording.
• If you want to play the disc on other DVD equipment, finalize the disc (page 35).

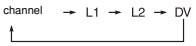
Hookups



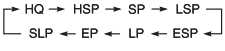
1 Insert a disc.
See "1. Inserting a Disc" on page 27.

2 Insert the source DV/Digital8 format tape into your digital video camera.
For the recorder to record or edit, your digital video camera must be set to video playback mode.

3 Press INPUT SELECT on the remote repeatedly to select "DV."
The front panel display changes as follows:



4 Press REC MODE on the remote repeatedly to select the recording mode.
The recording mode changes as follows:



For details about the recording mode, see page 39.

5 Press OPTIONS on the remote to select "DV / D8 Audio Input," and press ENTER. Then, select the setting for the audio input.
"Stereo1" (default): Records original sound only. Normally select this when dubbing a DV format tape.
"Mix": Records both stereo 1 and 2.
"Stereo2": Records additional audio only.
Select "Mix" or "Stereo2" only if you have added a second audio channel when recording with your digital video camera. You are ready to start dubbing. Select one of the dubbing methods on the following pages.

6 Adjust the dubbing picture quality and size.
Before dubbing starts, press OPTIONS to select "Rec Settings," and adjust the recording settings (page 42).

Hint
You can turn off the recorder during dubbing. The recorder completes dubbing even after being turned off.

Notes
• You cannot connect more than one piece of digital video equipment to the recorder.
• You cannot control the recorder using another device or another recorder of the same model.
• You cannot record date, time, or the contents of the cassette memory onto the disc.
• If you record from a DV/Digital8 format tape that is recorded in multiple sound tracks, such as a tape with multiple sampling frequencies (48 kHz, 44.1 kHz, or 32 kHz), no sound or an unnatural sound will be output when playing back the sampling frequency switch point on the disc.
• In order to use this recorder's "Auto Chapter" setting (page 68), be sure to correctly set the clock on your digital video camera before shooting.
• The recorded picture may be momentarily affected or the start and end points of a program may be different from what you have set if the source DV/Digital8 format tape is in any of the following conditions. In this case, see "Recording from connected equipment without a timer" (page 48).
– There is a blank space in the recorded portion of the tape.
– The tape's time code is not sequential.
– If the picture size or the recording mode on the tape being dubbed changes.

Recording an Entire DV Format Tape (One Touch Dubbing)

+RW -RWVR -RWVideo +R -RVR -RVideo

You can record the entire contents of a DV/Digital8 format tape onto a disc with a single press of the ONE-TOUCH DUB button on the recorder. The recorder controls the digital video camera for the whole process, and completes the recording.

◆How chapters are created
The contents dubbed to DVD become a single title. When "Auto Chapter" is set to "On" in the "Recording" setup, this title is divided into chapters. When dubbing a DVD-RW/DVD-R (VR mode), each shooting session on the tape becomes a chapter on the disc. For other discs, the recorder divides the title into chapters at approximately 6 minute intervals.

Follow steps 1 to 6 of "Preparing for DV/Digital8 dubbing" on page 66, and press ONE-TOUCH DUB on the recorder.
The recorder rewinds the tape and then starts recording the tape contents.
When the recording is finished, the recorder rewinds the tape in the digital video camera.

To stop during recording
Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

Hint
If you set "Finalize Disc" of "One Touch Dubbing" to "Auto" in the "DVD" setup (page 80), the recorded disc (except DVD-RW (VR mode)) will automatically be finalized after recording is finished.

Notes
- When a blank space between the recordings on the tape continues for more than five minutes, One Touch Dubbing ends automatically.
- The recorder records a blank for five minutes before it stops dubbing. To stop the blank recording, press ■ REC STOP.

Program Edit

+RW -RWVR -RWVideo +R -RVR -RVideo

You can select scenes from a DV/Digital8 format tape, and then automatically record selected scenes to a DVD.
To use this function, do the following:

Connect your digital video camera and prepare for recording

⬇

Select and edit the scenes you want to dub

Using the recorder's remote control, fast forward or rewind the tape to select the scenes. At this point, the selected scenes are not copied to the disc. The recorder only remembers the IN and OUT points of the scenes that you selected for dubbing. You can also erase or change the order of the scenes.

⬇

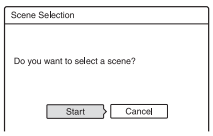
Dub the selected scenes

After you have selected the scenes, the recorder will fast forward and rewind the tape automatically and record the scenes to a DVD.

◆How chapters are created
The contents dubbed to DVD become a single title. When "Auto Chapter" is set to "On" in the "Recording" setup, this title is divided into chapters. When dubbing to a DVD-RW/DVD-R (VR mode), each shooting session on the tape and each selected scene becomes a chapter on the disc. For other discs, the recorder divides the title into chapters at approximately 6 minute intervals.

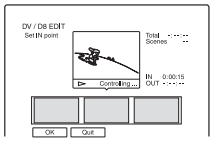
1 Follow steps 1 to 6 of "Preparing for DV/Digital8 dubbing" on page 66, and press SYSTEM MENU.

2 Select "DV / D8 EDIT," and press ENTER.
The display asks if you want to start selecting scenes.



- If you have previously saved a program, the display asks if you want to edit an existing program or to create a new program. To resume editing the existing program, select "Saved Data," and go to step 9.

3 Select "Start," and press ENTER.
The display for setting the IN point (start of the scene) appears.
The scene starts to play.



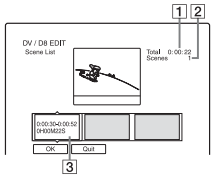
4 Select the IN point using ◀◀/▶▶, and press ENTER.
Playback pauses.

5 Press ENTER if the IN point is correct.
If the IN point is incorrect, select the IN point using ◀II/II▶, and press ENTER.
The display for setting the OUT point (end of the scene) appears.

6 Select the OUT point using ◀◀/▶▶, and press ENTER.
Playback pauses.

7 Press ENTER if the OUT point is correct.
If the OUT point is incorrect, select the OUT point using ◀II/II▶, and press ENTER.
The selected scene is added to the scene information block.
- To add more scenes, go to step 4.

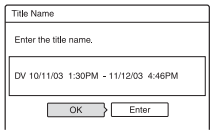
8 When you finish adding scenes, press ⬇.
The scene list is displayed.



1 Total duration of the program
2 Total number of scenes
3 Scene information block

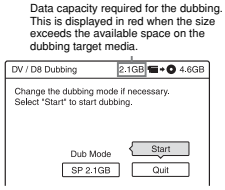
9 Select the scene information block you want to edit using ⬅/➡, and press ENTER.
The sub-menu appears.
"Move": Changes the scene order using ⬅/➡ and ENTER.
"Erase": Erases the scene. When asked for confirmation, select "OK."
"Preview": Plays the selected scene.
- To add more scenes, press ⬆ and go to step 4.

10 When you finish editing the scene list, select "OK," and press ENTER.
The display for entering the title name appears. To enter a new name, select "Enter," and follow the explanations on page 33.



➡continued

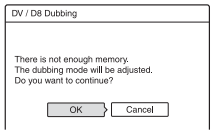
11 Select "OK," and press ENTER.
The title name is fixed, and the display asks if you want to start recording.
To change the dubbing mode, select "Dub Mode" and press ⬆/⬇.


Data capacity required for the dubbing. This is displayed in red when the size exceeds the available space on the dubbing target media.
DV / D8 Dubbing
2.1GB
4.6GB
Change the dubbing mode if necessary.
Select "Start" to start dubbing.
Dub Mode
SP 2.1GB
Start
Quit

12 Select "Start," and press ENTER.
The recorder starts recording the tape contents as programmed.

To stop during recording
Press ■ REC STOP.
Note that it may take a few seconds for the recorder to stop recording.

To automatically adjust the dubbing mode
If there is not enough available space on the target disc, the recorder automatically selects a dubbing mode with lower picture quality according to the available space. The same dubbing mode is set for all of the titles. If disc space is insufficient for the selected dubbing mode, the following display appears after step 12.



Select "OK" and go to step 12.
If you do not want to change the dubbing mode, select "Cancel." However, note that dubbing will end before the program is finished.

Notes
- If you set the beginning of the tape as the IN point and the end point as the OUT point, the IN and OUT points may move slightly during dubbing.
- You cannot set a scene to be shorter than one second.

Settings and Adjustments

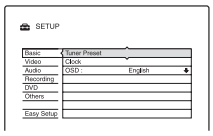
Antenna Reception and Language Settings (Basic)

The "Basic" setup helps you to make tuner, clock, and channel settings for the recorder.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select "SETUP," and press ENTER.

3 Select "Basic," and press ENTER.
The options for "Basic" appear. The default settings are underlined.
To turn off the display, press SYSTEM MENU repeatedly.

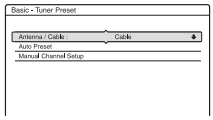


Tuner Preset

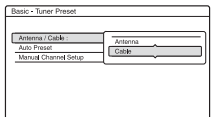
Note
You cannot preset channels for the connected cable box or satellite receiver.

Auto Preset
Automatically presets the receivable channels. The recorder can receive VHF channels 2 to 13, UHF channels 14 to 69, and unscrambled CATV channels 1 to 125. First, we recommend that you preset the receivable channels in your area using automatic presetting methods.

1 Select "Tuner Preset" in "Basic," and press ENTER.



2 Select "Antenna / Cable," and press ENTER.



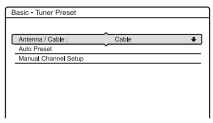
Antenna	Presets VHF and UHF channels.
Cable	Presets cable TV channels.

3 Select an option, and press ENTER.

4 Select "Auto Preset," and press ENTER.
All receivable channels are preset in numerical sequence.

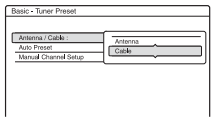
Manual Channel Setup
Presets or disables channels manually.
If some channels could not be set using the "Auto Preset" or "Easy Setup" function, you can set them manually.

1 Select "Tuner Preset" in "Basic," and press ENTER.



➡continued

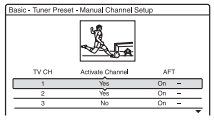
2 Select “Antenna / Cable,” and press ENTER.



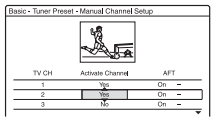
Antenna	Presets VHF and UHF channels.
Cable	Presets cable TV channels.

3 Select an option, and press ENTER.

4 Select “Manual Channel Setup,” and press ENTER.



5 Press ↑/↓ to select the channel you want to activate, and press ENTER.

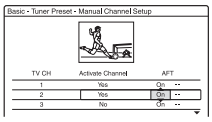


6 Press ←/→ to select “Activate Channel,” and press ENTER.
The disabled channel will be skipped when you press CH +/–.

Yes	Activates the channels.
No	Disables the channels.

7 Press ↑/↓ to select “Yes” to activate the channel.

8 Press → to select “AFT.”



On	Turns on the Auto Fine Tuning function. Normally, select this.
Off	Allows you to adjust the picture manually.

9 Select “On” to turn on AFT, and press ENTER.
- If the Auto Fine Tuning function does not work effectively, select “Off” in step 8 and press →. Press ↑/↓ to obtain a clearer picture, and press ENTER.

10 To preset or disable another channel, repeat from step 5.

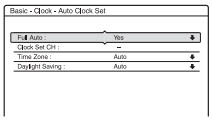
Clock

Auto (Auto Clock Set)

Turns on the Auto Clock Set function when a channel in your local area broadcasts a time signal.

1 Select “Clock” in “Basic,” and press ENTER.

2 Select “Auto,” and press ENTER.

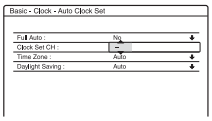


3 Select “Full Auto,” and press ENTER.

Yes	Automatically sets your time zone and Daylight Saving Time (if applicable).
No	Allows you to adjust your time zone and Daylight Saving Time manually, without turning off the Auto Clock Set function.

4 Select “Yes,” and press ENTER.
The recorder automatically sets the clock by searching for a channel that carries a time signal and sets your time zone and Daylight Saving Time (if applicable).
- If the clock does not activate, your clock setting is incorrect. After repeating steps 1 to 3 above, select “No” in step 4 and press ENTER. Then select “Clock Set CH,” “Time Zone,” or “Daylight Saving” and press ENTER. Adjust these settings by pressing ↑/↓ and ENTER.

◆Clock Set CH
Select a channel that carries a time signal using the number buttons.
Use this option if you know of a channel that carries a time signal. Most PBS member stations broadcast a time signal. For the fastest response select your local PBS station. Leave the setting at “--” to have the recorder automatically search for a channel that carries a time signal.
To return to “--,” enter “0.”



◆Time Zone
Select the time zone for your area, or select “Auto” to have the recorder automatically set your time zone.
The options are:
Auto ⟷ Atlantic ⟷ Eastern ⟷ Central ⟷ Mountain ⟷ Pacific ⟷ Alaska ⟷ Hawaii ⟷ Auto

◆Daylight Saving
Select “On” or “Off” (standard time), or select “Auto” to have the recorder automatically set the daylight saving time.

Hint
If you set “Full Auto” to “Yes,” the Auto Clock Set function is activated whenever the recorder is turned off.

Manual (Manual Clock Set)

If the Auto Clock Set function did not set the clock correctly for your local area, set the clock manually.

1 Select “Clock” in “Basic,” and press ENTER.

2 Select “Manual,” and press ENTER.

3 Press ↑/↓ to set the month, and press →.
Set the day, year, hour, and minutes in sequence. Press ←/→ to select the item to be set, then press ↑/↓ to set the numbers. The day of the week is set automatically.

4 Press ENTER to start the clock.

Hint
To change the numbers in step 3, press ← to return to the item to be changed, and select the numbers by pressing ↑/↓.

OSD (On-Screen Display)

Switches the display language on the screen.

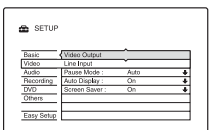
Video Settings (Video)

Video settings will adjust items related to the image, such as size and color.
Choose the settings according to the type of TV, tuner, or decoder connected to the DVD recorder.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Video,” and press ENTER.
The “Video” setup appears with the following options. The default settings are underlined.



Video Output

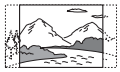
◆TV Type
Sets the picture size when playing back a title recorded from 16:9 size video (page 42) or a 16:9 size commercial DVD video.
Select the playback picture size according to the type of connected TV (wide-screen/wide mode TV or conventional 4:3 screen TV).

16:9	Select this when connecting to a wide-screen TV or TV with a wide mode function.
4:3 Letter Box	Select this when connecting to a 4:3 screen TV. Displays a wide picture with bands on the upper and lower portions of the screen.
4:3 Pan Scan	Select this when connecting to a 4:3 screen TV. Automatically displays a wide picture on the entire screen and cuts off the portions that do not fit.

16:9

4:3 Letter Box

4:3 Pan Scan



Note
Depending on the disc, “4:3 Letter Box” may be selected automatically instead of “4:3 Pan Scan” or vice versa.

◆Y/Pb/Pr Out Black Level
Selects the black level (setup level) for the video signals output from the COMPONENT VIDEO OUT jacks (page 16).
This setting is not effective when the recorder outputs progressive signals.

On	Raises the standard black level. Select this when the picture appears too dark.
Off	Sets the black level of the output signal to the standard level. Normally, select this.

◆Progressive Output
If your TV accepts progressive (480p) format signals, set “Progressive Output” to “On.” You will enjoy accurate color reproduction and high quality images.

1 Select “Progressive Output,” and press ENTER.

2 Select “On,” and press ENTER.
The display asks for confirmation.

3 Select “Start,” and press ENTER.
The video switches to a progressive signal for 5 seconds.

4 If video signal appears OK, select “Yes,” and press ENTER.
If picture is distorted, select “No,” and press ENTER.

◆Progressive Mode
DVD software can be divided into two types: film based software and video based software. Video based software is derived from TV and displays images at 30 frames/60 fields per second. Film based software is derived from film and displays images at 24 frames per second. Some DVD software contains both Video and Film.
In order for these images to appear natural on your screen when output in progressive mode, the progressive video signal needs to be converted to match the type of DVD software that you are watching.
You can fine-tune the progressive 480p video signal that is output when you set “Progressive Output” to “On.”
Note that you must connect to a progressive format TV using the COMPONENT VIDEO OUT jacks (page 16).

Auto	Automatically detects the software type (Film-based or Video-based) and selects the appropriate conversion mode. Normally select this position.
Video	Fixes the conversion mode to the mode for Video-based software.

Note
When picture noise appears after you set the recorder to progressive format, hold down ■ STOP, and press CHANNEL – (minus) on the unit.

Line Input

Sets the method of inputting video signals from the LINE IN jacks on the rear panel of the recorder. Select an option for each of the items below according to the combination of jacks and methods that you are going to use.

◆Line1 Input
Selects a method of inputting video signals for the LINE 1 IN jack on the rear panel of the recorder.

Video	Inputs video signals.
S Video	Inputs S video signals.

Pause Mode (DVDs only)

Selects the picture quality in pause mode.

Auto	The picture, including subjects that move dynamically, is output with no jitter. Normally select this position.
Frame	The picture, including subjects that do not move dynamically, is output in high resolution.

Auto Display

On	Automatically displays information on the screen when the recorder is turned on, etc.
Off	Displays information only when DISPLAY is pressed.

Screen Saver

The screen saver image appears when you do not use the recorder for more than 10 minutes while an on-screen display, such as the System Menu, is displayed on your TV screen. The screen saver image helps prevent your display device from becoming damaged (ghosting).

On	Turns on the screen saver function.
Off	Turns off the function.

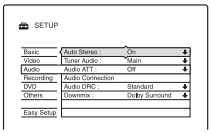
Audio Settings (Audio)

The “Audio” setup allows you to adjust the sound according to the playback and connection conditions.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Audio,” and press ENTER.
The “Audio” setup appears with the following options. The default settings are underlined.



Auto Stereo

This function is effective only when “Tuner Audio” is set to “Main.”

On	Receives stereo programs. Normally select this.
Off	Select this to reduce noise. The sound changes to monaural.

Tuner Audio

Selects the sound to be recorded.

Main	Records only the main sound.
SAP	Records only the SAP (Second Audio Program) sound.

Note
If no SAP sound is received, the main sound is recorded regardless of the setting.

Audio ATT (attenuation)

If the playback sound is distorted, set this item to “On.” The recorder reduces the audio output level.
This function affects the output of the following jacks:
– LINE OUT R-AUDIO-L jacks

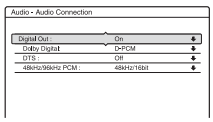
On	Select this when the playback sound from the speakers is distorted.
Off	Normally select this position.

Audio Connection

The following setup items switch the method of outputting audio signals when you connect a component such as an amplifier (receiver) with a digital input jack.
For connection details, see “Step 3: Connecting the Audio Cords” on page 18. Select “Dolby Digital,” “DTS,” and “48kHz/96kHz PCM” after setting “Digital Out” to “On.”

If you connect a component that does not accept the selected audio signal, a loud noise (or no sound) will come out from the speakers, and may affect your ears or cause speaker damage.

1 Select “Audio Connection” in “Audio,” and press ENTER.



2 Select “Digital Out,” and press ENTER.

On	Normally select this position.
Off	The influence of the digital circuit upon the analog circuit is minimal.

3 Select “On,” and press ENTER.

4 Set the digital output signal.

• Dolby Digital (DVDs only)
Selects the type of Dolby Digital signal.

D-PCM	Select this when the recorder is connected to an audio component lacking a built-in Dolby Digital decoder. The surround effects of output signals are determined by the “Downmix” setting item in the “Audio” setup.
Dolby Digital	Select this when the recorder is connected to an audio component with a built-in Dolby Digital decoder.

• DTS (DVD VIDEOs only)
Selects whether or not to output DTS signals.

On	Select this when the recorder is connected to an audio component with a built-in DTS decoder.
Off	Select this when the recorder is connected to an audio component without a built-in DTS decoder.

• 48kHz/96kHz PCM (DVD VIDEOs only)
Selects the sampling frequency of the audio signal.

48kHz/16bit	The audio signals of DVD VIDEOs are converted to 48 kHz/16 bit and output.
96kHz/24bit	All signals containing 96 kHz/24 bit are output without conversion. However, the signals are output at 48 kHz/16 bit if copyright-protected signals are contained.

Note
“48kHz/96kHz PCM” setting has no effect when audio signals are output from the LINE OUT (R-AUDIO-L) jacks. If the sampling frequency is 96kHz, signals are simply converted to analog signals and output.

Audio DRC (Dynamic Range Control) (DVDs only)

Selects the dynamic range (difference between soft and loud sounds) setting when playing a DVD that conforms to Audio DRC. This affects the output from the following jacks:
– LINE OUT R-AUDIO-L jacks
– DIGITAL OUT (COAXIAL) jack only when “Dolby Digital” is set to “D-PCM” (page 76).

Standard	Normally select this position.
TV Mode	Makes low sounds clear even if you turn the volume down.
Wide Range	Gives you the feeling of being at a live performance.

Downmix (DVDs only)

Switches the method for mixing down to two channels when you play a DVD which has rear sound elements (channels) or is recorded in Dolby Digital format. For details on the rear signal components, see “4. Displaying the Playing/Remaining Time and Play Information” on page 30. This function affects the output of the following jacks:
– LINE OUT R-AUDIO-L jacks
– DIGITAL OUT (COAXIAL) jack when “Dolby Digital” is set to “D-PCM” (page 76).

Dolby Surround	Normally select this position. Multi-channel audio signals are output to two channels for enjoying surround sounds.
Normal	Multi-channel audio signals are downmixed to two channels for use with your stereo.

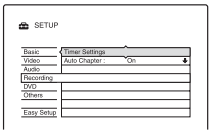
Recording Settings (Recording)

The “Recording” setup allows you to adjust recording settings.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

3 Select “Recording,” and press ENTER.
The “Recording” setup appears with the following options. The default settings are underlined.



Timer Settings

◆Rec Mode Adjust

On	Automatically adjusts the recording mode to enable the entire program to be recorded (page 41).
Off	Turns off the function.

Auto Chapter

Selects whether to automatically divide a recording (a title) into chapters during recording or dubbing.

On	Inserts chapter marks at approximately 6 minute intervals.
Off	No chapter mark is inserted.

Notes
- The actual chapter mark interval may vary depending on the amount of information contained in the video to be recorded.
- Chapter marks are automatically inserted where the recordings start on the tape when “Auto Chapter” is set to “On” during DV/Digital8 dubbing to a DVD-RW/DVD-R (VR mode).

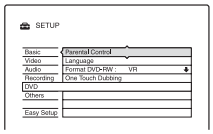
Disc Settings (DVD)

The “DVD” setup allows you to adjust parental control, language and other DVD related settings.

1 Press SYSTEM MENU while the recorder is in stop mode.

2 Select “SETUP,” and press ENTER.

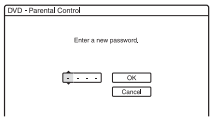
3 Select “DVD,” and press ENTER.
The “DVD” setup appears with the following options. The default settings are underlined.



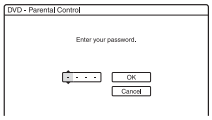
Parental Control (DVD VIDEO only)

Playback of some DVD VIDEOs can be limited according to a predetermined level, such as the age of the users. Scenes may be blocked or replaced with different scenes.

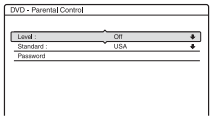
1 Select “Parental Control” in “DVD,” and press ENTER.
- If you have not entered a password, the display for registering a new password appears.



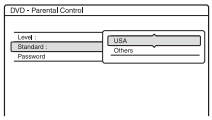
- When you have already registered a password, the display for entering the password appears.



2 Enter your four-digit password using the number buttons, then select “OK” and press ENTER.



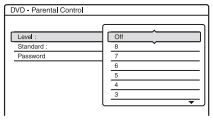
3 Select “Standard,” and press ENTER. The selection items for “Standard” are displayed.



4 Select a geographic area as the playback limitation level, and press ENTER. The area is selected.
- When you select “Others,” press the number buttons to select and enter an area code in the table (page 95). Then select “OK” and press ENTER.

➡continued

5 Select “Level,” and press ENTER.
The selection items for “Level” are displayed.



The lower the value, the stricter the limitation.
Discs rated higher than the selected level will be restricted.

6 Select the level, and press ENTER.
The Parental Control setting is complete.

To cancel the Parental Control setting for the disc, set “Level” to “Off” in step 6. To change the password, select “Password” in step 3, and press ENTER. When the display for registering a password appears, enter a new four-digit password using the number buttons, then select “OK” and press ENTER.

Notes
- If you forget your password, you will have to reset it by selecting “Parental Control” of “Factory Setup” in the “Others” setup (page 81).
- When you play discs which do not have the Parental Control function, playback cannot be limited on this recorder.
- Depending on the disc, you may be asked to change the Parental Control level while playing the disc. In this case, enter your password, then change the level.

Language (DVD VIDEO only)

◆DVD Menu
Switches the language for the DVD menu.

◆Audio
Switches the language of the sound track. When you select “Original,” the language given priority in the disc is selected.

◆Subtitle
Switches the language of the subtitles recorded on the disc.
When you select “Audio Follow,” the subtitle language changes according to the language you selected for the sound track.

Hint
If you select “Others” in “DVD Menu,” “Subtitle,” or “Audio,” select and enter a language code from “Language Code List” on page 95 using the number buttons.

Note
If you select a language in “DVD Menu,” “Subtitle,” or “Audio” that is not recorded on the DVD VIDEO, one of the recorded languages will be automatically selected.

Format DVD-RW (DVD-RW only)
The recorder automatically starts formatting in VR mode or Video mode, whichever is selected below, when a new, unformatted DVD-RW is inserted.

VR	Automatically formats the disc in VR mode.
Video	Automatically formats the disc in Video mode.

One Touch Dubbing
Displays the following options for the One Touch Dub function.

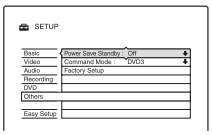
◆Finalize Disc (for all recordable discs except DVD-RW in VR mode)
Selects whether or not to finalize the disc automatically following One Touch Dubbing (page 68).

Auto	Automatically finalizes the disc following One Touch Dubbing.
Manual	Allows you to finalize the disc manually.

Remote Control Settings/ Factory Settings (Others)

The “Others” setup allows you to set up other operational settings.

1 Press SYSTEM MENU while the recorder is in stop mode.
2 Select “SETUP,” and press ENTER.
3 Select “Others,” and press ENTER.
The “Others” setup appears with the following options. The default settings are underlined.



Power Save Standby
Selects whether this recorder is in power save mode and adjusts the lighting of the front panel display.

On	Sets to power save mode to make the lighting dark. Turn off the lighting when the power is off.
Off	Does not set to power save mode and make the lighting bright.

Command Mode
Changes the Command Mode of the recorder if other DVD equipment is assigned the same Command Mode. For details, see “If you have a Sony DVD player or more than one Sony DVD recorder” on page 21.

Factory Setup
Allows you to select the setup settings by group, and return them to their default settings. Note that all of your previous settings will be lost.

1 Select “Factory Setup” in “Others,” and press → or ENTER.
The display for selecting a group of settings appears.

2 Select the group of settings you want to return to default from “Basic,” “Video,” “Audio,” “Recording,” “DVD,” “Others,” “Parental Control,” and “All,” and press → or ENTER.

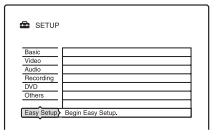
3 Select “Start,” and press ENTER.
The selected settings return to their default settings.

4 Press ENTER when “Finish” appears.

Easy Setup (Resetting the Recorder)

Select this to run the “Easy Setup” program.

1 Press SYSTEM MENU while the recorder is in stop mode.
2 Select “SETUP,” and press ENTER.
3 Select “Easy Setup,” and press ENTER.



4 Select “Start.”
5 Follow the instructions for “Easy Setup” (page 23) from step 2.

Additional Information

Troubleshooting

If you experience any of the following difficulties while using the recorder, use this troubleshooting guide to help remedy the problem before requesting repairs. Should any problem persist, consult your nearest Sony dealer.

Power

The power does not turn on.
→ Check that the AC power cord is connected securely.

Picture

There is no picture.
→ Re-connect all connecting cords securely.
→ The connecting cords are damaged.
→ Check the connection to your TV (page 12).
→ Switch the input selector on your TV (such as to “VCR”) so that the signal from the recorder appears on the TV screen.
→ When playing a double-layer DVD, the video and audio may be momentarily interrupted at the point where the layers switch.

Picture noise appears.
→ If the picture output signal from your recorder passes through your VCR to get to your TV, or if you are connected to a combination TV/VIDEO player, the copy-protection signal applied to some DVD programs could affect picture quality. If you still experience this problem even when you connect your recorder directly to your TV, try connecting your recorder to your TV’s S VIDEO input.
→ You have set the recorder to progressive format even though your TV cannot accept the progressive signal. In this case, hold down ■ STOP, and press CHANNEL – (minus) on the unit.
→ Even if your TV is compatible with progressive format (480p) signals, the image may be affected when you set the recorder to progressive format. In this case, hold down ■ STOP, and press CHANNEL – (minus) on the unit and the recorder is set to normal (interlace) format.
→ When playing a double-layer DVD, the video and audio may be momentarily interrupted at the point where the layers switch.

There is no picture or the picture noise appears when connected to the DV IN jack.
→ Try the following:
①Turn the recorder off and on again.
②Turn the connected equipment off and on again. ③Disconnect and then connect the i.LINK cable again.

TV program reception does not fill the screen.
→ Set the channel manually in “Tuner Preset” in the “Basic” setup (page 71).
→ Select the correct source using the INPUT SELECT button, or select a channel of any TV program using the CH +/– buttons.

TV program pictures are distorted.
→ Reorient the TV antenna.
→ Adjust the picture (see the TV’s instruction manual).
→ Place the recorder and TV farther apart.
→ Place the TV and any bunched antenna cables farther apart.
→ The antenna cable is connected to the VHF/UHF OUT jack on the recorder. Connect the cable to the VHF/UHF IN jack.

TV channels cannot be changed.
→ The channel is disabled (page 71).
→ A timer recording started, which changed the channels.

→continued

The picture from equipment connected to the recorder's input jack does not appear on the screen.

➡ If the equipment is connected to the LINE 1 IN jack, select "L1" in the front panel display by pressing CH +/– or INPUT SELECT.
If the equipment is connected to the LINE 2 IN jacks, select "L2" in the front panel display by pressing CH +/– or INPUT SELECT.
If the equipment is connected to the DV IN jack, (this is usually for a digital video camera connection), select "DV" in the front panel display by pressing INPUT SELECT.

➡ When an S video cable is connected to the recorder's LINE 1 IN jack, set "Line1 Input" of the "Line Input" to "S Video" in the "Video" setup (page 75).

The playback picture or TV program from the equipment connected through the recorder is distorted.

➡ If the playback picture output from a DVD player, VCR, or tuner goes through your recorder before reaching your TV, the copy-protection signal applied to some programs could affect picture quality. Disconnect the playback equipment in question and connect it directly to your TV.

The picture does not fill the screen.

➡ Set "TV Type" of the "Video Output" in the "Video" setup in accordance with the screen size of your TV (page 74).

The picture does not fill the screen, even though the picture size is set in "TV Type" of the "Video Output" in the "Video" setup.

➡ The picture size of the title is fixed.

Sound

There is no sound.

➡ Re-connect all connections securely.
➡ The connecting cord is damaged.
➡ The input source setting on the amplifier or the connection to the amplifier is incorrect.

➡ The recorder is in reverse play, fast-forward, slow motion, or pause mode.
➡ If the audio signal does not come through the DIGITAL OUT (COAXIAL) jack, check the "Audio Connection" settings in the "Audio" setup (page 76).

Sound distortion occurs.

➡ Set "Audio ATT" in the "Audio" setup to "On" (page 76).

Sound is noisy.

➡ When playing a CD with DTS sound tracks, noise will come from the LINE OUT R-AUDIO-L jacks (page 52).

The sound volume is low.

➡ The sound volume is low on some DVDs. The sound volume may improve if you set "Audio DRC" in the "Audio" setup to "TV Mode" (page 77).
➡ Set "Audio ATT" in the "Audio" setup to "Off" (page 76).

An alternate audio track cannot be recorded or played.

➡ Second Audio Program (SAP) is not available for all programs. The program you are recording does not have a second audio program.
➡ You have set "Tuner Audio" in the "Audio" setup to "Main" (page 76). Select "SAP" to record alternate audio programs.
➡ If you have connected an AV amplifier to the DIGITAL OUT (COAXIAL) jack and want to change the audio track for DVD-RWs/DVD-Rs (VR mode) during playback, set "Dolby Digital" of the "Audio Connection" in the "Audio" setup to "D-PCM" (page 76).

Playback

The recorder does not play any type of disc.

➡ The disc is upside down. Insert the disc with the labeled side facing up.
➡ The disc is not correctly inserted.
➡ Moisture has condensed inside the recorder. In this case, if the recorder is on, leave it on (if it is off, leave it off) for about an hour until the moisture evaporates.

➡ If the disc was recorded on another recorder and was not finalized (page 35), the recorder cannot play the disc.

The recorder does not start playback from the beginning.

➡ Resume play was activated (page 50).
➡ You have inserted a DVD whose Title menu or DVD menu automatically appears on the TV screen when it is first inserted. Use the menu to start playback.

The recorder starts playing automatically.

➡ The DVD VIDEO features an auto playback function.

Playback stops automatically.

➡ If the DVD has an auto pause signal, the recorder stops playback at the auto pause signal.

Some functions such as Stop, Search, or Slow-motion Play cannot be performed.

➡ Depending on the DVD, you may not be able to do some of the operations above. See the instruction manual supplied with the disc.

The language for the sound track cannot be changed.

➡ Multilingual tracks are not recorded on the DVD being played.
➡ The DVD VIDEO prohibits the changing of the language for the sound track.
➡ Try changing the language using the DVD VIDEO's menu.

The subtitle language cannot be changed or turned off.

➡ Multilingual subtitles are not recorded on the DVD VIDEO.
➡ The DVD VIDEO prohibits changing of the subtitles.
➡ Try changing the subtitle using the DVD VIDEO's menu.
➡ The subtitles cannot be changed for the titles recorded on this recorder.

The angles cannot be changed.

➡ Multi-angles are not recorded on the DVD VIDEO being played.
➡ You are trying to change the angles when "" does not appear on the TV screen (page 49).
➡ The DVD VIDEO prohibits changing angles.
➡ Try changing the angle using the DVD VIDEO's menu.
➡ The angles cannot be changed for the titles recorded on this recorder.
➡ The angles cannot be changed during slow motion playback or when playback is paused.

The MP3 audio tracks do not play.

➡ The MP3 audio tracks are not recorded in a format that the recorder can play (page 55).

The JPEG image files do not play.

➡ The JPEG image files are not recorded in a format that the recorder can play (page 55).
➡ Progressive JPEG images cannot be played.

Recording/Timer recording/ Editing

The channel cannot be changed from the channel you are recording.

➡ Set the TV's input source to "TV."

Recording does not start immediately after you press ● REC.

➡ Operate the recorder only after "LOAD," "FORMAT," or "INFOWRITE" disappears from the front panel display.

Nothing was recorded even though you set the timer setting correctly.

➡ There was a power failure during recording.
➡ The recorder's internal clock stopped due to a power failure that lasted for more than 1 hour. Reset the clock (page 72).
➡ The channel was disabled after the timer recording was set. See "Tuner Preset" on page 71.
➡ Disconnect the AC power cord from the AC outlet, and connect it again.
➡ The program contains copy protection signals that restrict copying.
➡ The timer setting overlapped another setting that was set later.
➡ There is no DVD inside the recorder.

➡ continued

➡ There is not enough disc space for the recording.
➡ A separate recording was in the process of being made without the use of the timer (page 47).
➡ The recorder was in the process of DV/ Digital8 Dubbing.

Recording does not stop immediately after you press ■ REC STOP.

➡ It will take a few seconds for the recorder to input disc data before recording can stop.

Recording does not stop after you press ■ STOP.

➡ Press ■ REC STOP.

Timer recording is not complete or did not start from the beginning.

➡ There was a power failure during recording. If the power recovers when there is a timer recording, the recorder resumes recording. Should the power failure continue for more than 1 hour, reset the clock (page 72).
➡ Disc space was not enough.

Contents previously recorded were erased.

➡ Data that is not playable on this recorder but was recorded on a DVD with a PC will be erased from the disc when the disc is inserted.

Recording from the equipment with a timer

Nothing was recorded even though you set the Synchro-Rec setting correctly.

➡ You forgot to turn off the connected equipment. Turn off the connected equipment and set the recorder to Synchro-Rec standby mode (page 47).
➡ The recorder was not set to the Synchro-Recording standby mode. Press → ● SYNCHRO REC to have the recorder stand by for recording. Make sure the SYNCHRO REC indicator lights up on the front panel (page 47).
➡ The equipment is not connected to the LINE 1 IN jacks of the recorder.

➡ The recorder is connected to the TV output jack of the connected equipment.

Synchro-Recording does not complete.

➡ The timer setting for the connected equipment overlapped the recorder's timer setting (page 48).
➡ There was a power failure during the recording.

The recorder automatically starts recording when the satellite receiver is turned on.

➡ The Synchro-Rec function was activated. Turn off the satellite receiver and cancel the Synchro-Rec function (page 47).

Display

The clock has stopped.

➡ Set the clock again (page 72).
➡ The clock stopped due to a power failure that lasted for more than 1 hour. Reset the clock (page 72).

The TIMER REC indicator is flashing.

➡ The disc does not have enough space.
➡ Insert a recordable disc inside the recorder.
➡ The inserted DVD is protected (page 35).

The recording mode indication is incorrect.

➡ When the recording or dubbing is less than ten minutes, or if a picture with little movement is displayed for more than ten minutes, the recording mode indication may be displayed incorrectly. Note that the actual recording or dubbing itself was correctly made in the selected recording mode.
➡ After playing titles recorded in EP and SLP mode, the recording mode indication may change depending on the recorded program.

The clock does not appear in the front panel display when the recorder is turned off.

➡ "Power Save Standby" in the "Others" setup is set to "On" (page 81), and the recorder is in standby mode.

Remote control

The remote does not function.

➡ Batteries are weak.
➡ The remote is too far from the recorder.
➡ The remote's manufacturer code returned to the default setting when you replaced the batteries. Reset the code (page 20).
➡ The remote is not pointed at the remote sensor on the recorder.
➡ Different command modes are set for the recorder and remote. Set the same command mode (page 21). The default command mode setting for this recorder and the supplied remote is DVD3.
➡ Press ■ STOP on the unit while the recorder is turned off to check the current command mode.

Others

The recorder does not operate properly.

➡ Restart the recorder. Press down I/⏻ on the recorder for more than ten seconds until "WELCOME" appears in the front panel display.
➡ When static electricity, etc., causes the recorder to operate abnormally, turn off the recorder and wait until the clock appears in the front panel display. Then, unplug the recorder and after leaving it off for a while, plug it in again.

Five numbers or letters are displayed in the front panel display.

➡ The self-diagnosis function was activated (see the table on page 88).

The disc tray does not open after you press ⏏ OPEN/CLOSE.

➡ It may take a few seconds for the disc tray to open after you have recorded or edited a DVD. This is because the recorder is adding disc data to the disc.

The disc tray does not open and "LOCKED" appears in the front panel display.

➡ The disc tray is locked. Cancel the Child Lock (page 50).

The disc tray does not open and "TRAY LOCKED" appears in the front panel display.

➡ Contact your Sony dealer or local authorized Sony service facility.

The disc tray does not open and you cannot remove the disc after you press ⏏ OPEN/CLOSE.

➡ Turn off the recorder. Once the clock appears in the front panel display, disconnect the AC power cord. (If the recorder does not turn off or if the clock does not appear in the front panel display, disconnect the AC power cord anyway.) Connect the AC power cord again while pressing down ⏏ on the recorder, and release the button when the disc tray opens. Then, keep I/⏻ on the recorder pressed for about ten seconds until "WELCOME" appears in the front panel display.

"RECOVERY" appears in the front panel display.

➡ The recorder's recovery function was activated when the recorder was turned on because the power was turned off or failed during recording. Leave the recorder on until "RECOVERY" disappears from the front panel display.

"FAN ERROR" appears in the front panel display.

➡ Check that the vent on the rear of the recorder is not blocked. Then, immediately disconnect the AC power cord. Leave the recorder off for a while, then re-connect the AC power cord, and press I/⏻ on the recorder.

Mechanical sound is heard when the recorder is off.

➡ While the recorder is adjusting the clock for the Auto Clock Set function or during a timer recording, operational noises (such as the internal fan) may be heard, even when the power is off. This is not a malfunction.

Self-diagnosis Function (When letters/numbers appear in the display)

When the self-diagnosis function is activated to prevent the recorder from malfunctioning, a five-character service number (e.g., C 13 00) with a combination of a letter and four numbers appears in the front panel display. In this case, check the following table.

First three characters of the service number	Cause and/or corrective action
C 13	The DVD is dirty. ➡ Clean the disc with a soft cloth.
C 31	The DVD/CD is not inserted correctly. ➡ Re-insert the disc correctly.
E XX (xx is a number)	To prevent a malfunction, the recorder has performed the self-diagnosis function. ➡ Contact your nearest Sony dealer or local authorized Sony service facility and give the five-character service number. Example: E 61 10

Notes About This Recorder

On operation

- If the recorder is brought directly from a cold to a warm location, or is placed in a very damp room, moisture may condense on the lenses inside the recorder. Should this occur, the recorder may not operate properly. In this case, if the recorder is on, leave it on (if it is off, leave it off) for about an hour until the moisture evaporates.
- When you move the recorder, take out any discs. If you don't, the disc may be damaged.

On adjusting volume

Do not turn up the volume while listening to a section with very low level inputs or no audio signals. If you do, the speakers may be damaged when a peak level section is played.

On cleaning

Clean the cabinet, panel, and controls with a soft cloth slightly moistened with a mild detergent solution. Do not use any type of abrasive pad, scouring powder or solvent such as alcohol or benzine.

On cleaning discs, disc/lens cleaners

Do not use a commercially available cleaning disc or disc/lens cleaner (wet or spray type). These may cause the recorder to malfunction.

Notes about the discs

- To keep the disc clean, handle the disc by its edge. Do not touch the surface. Dust, fingerprints, or scratches on the disc may cause it to malfunction.

- Do not expose the disc to direct sunlight or heat sources such as hot air ducts, or leave it in a car parked in direct sunlight as the temperature may rise considerably inside the car.
- After playing, store the disc in its case.
- Clean the disc with a cleaning cloth. Wipe the disc from the center out.

- Do not use solvents such as benzine, thinner, commercially available cleaners, or anti-static spray intended for vinyl LPs.
- Do not use the following discs.
  - A disc that has a non-standard shape (e.g., card, heart).
  - A disc with a label or sticker on it.
  - A disc that has cellophane tape or sticker adhesive on it.

Specifications

System

Laser: Semiconductor laser
Channel coverage:
NTSC
VHF: 2 to 13
UHF: 14 to 69
CATV: A-8 to A-1, A to W, W+1 to W+84
Video reception: Frequency synthesizer system
Audio reception: Inter carrier system
Antenna: 75-ohm antenna terminal for VHF/UHF
Timer: Clock: Quartz locked/Timer indication: 12-hour cycle (digital)/ Power back-up duration: 1 hour
Video recording format: MPEG-2, MPEG-1
Audio recording format/applicable bit rate: Dolby Digital 2 ch 256 kbps/128 kbps (in EP and SLP mode)

Inputs and outputs

LINE OUT
(AUDIO): Phono jack/2 Vrms/10 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.286 Vp-p
LINE 1 IN/LINE 2 IN
(AUDIO): Phono jack/2 Vrms/more than 22 kilohms
(VIDEO): Phono jack/1.0 Vp-p
(S VIDEO): 4-pin mini DIN/Y: 1.0 Vp-p, C: 0.286 Vp-p
DV IN: 4-pin/i.LINK S100
DIGITAL OUT (COAXIAL): Phono jack/ 0.5 Vp-p/75 ohms
COMPONENT VIDEO OUT (Y, P_B, P_R):
Phono jack/Y: 1.0 Vp-p/
P_B, P_R: 0.7 Vp-p

➡continued

General

Power requirements: 120 V AC, 60 Hz
Power consumption: 22 W
Dimensions (approx.):
430 × 58 × 291 mm
(17 × 2 ⅜ × 11 ½ in.) (width/height/ depth) incl. projecting parts
Mass (approx.): 3.1 kg (6.83 lb)
Operating temperature:
5ºC to 35ºC (41ºF to 95ºF)
Operating humidity: 25% to 80%
Supplied accessories:
Audio/video cord (1)
Power cord (1)
Antenna cable (1)
Remote commander (remote) (1)
Size AA (R6) batteries (2)

Specifications and design are subject to change without notice.

About i.LINK

The DV IN jack on this recorder is i.LINK-compliant for digital video cameras. This section describes the i.LINK standard and its features.

What is i.LINK?

i.LINK is a digital serial interface for handling digital video, digital audio and other data in two directions between equipment having the i.LINK jack, and for controlling other equipment.
i.LINK-compatible equipment can be connected by a single i.LINK cable. Possible applications are operations and data transactions with various digital AV equipment. When two or more i.LINK-compatible equipment are connected to this recorder in a daisy chain, operations and data transactions are possible with not only the equipment that this recorder is connected to but also with other devices via the directly connected equipment.
Note, however, that the method of operation sometimes varies according to the characteristics and specifications of the equipment to be connected, and that operations and data transactions are sometimes not possible on some connected equipment.

Note
Normally, only one piece of equipment can be connected to this recorder by the i.LINK cable (DV connecting cable). When connecting this recorder to i.LINK-compatible equipment having two or more i.LINK jacks (DV jacks), see the instruction manual of the equipment to be connected.

About the name "i.LINK"

i.LINK is a more familiar term for IEEE 1394 data transport bus proposed by SONY, and is a trademark approved by many corporations. IEEE 1394 is an international standard standardized by the Institute of Electrical and Electronics Engineers.

i.LINK baud rate

i.LINK's maximum baud rate varies according to the equipment. Three maximum baud rates are defined:
S100 (approx. 100 Mbps*)
S200 (approx. 200 Mbps)
S400 (approx. 400 Mbps)

The baud rate is listed under "Specifications" in the instruction manual of each equipment. It is also indicated near the i.LINK jack on some equipment.
The maximum baud rate of equipment on which it is not indicated such as this unit is "S100."
When units are connected to equipment having a different maximum baud rate, the baud rate sometimes differs from the indicated baud rate.

* What is Mbps?
Mbps stands for megabits per second, or the amount of data that can be sent or received in one second. For example, a baud rate of 100 Mbps means that 100 megabits of data can be sent in one second.

i.LINK functions on this recorder

For details on how to dub when this recorder is connected to other video equipment having DV jacks, see page 66.
The DV jack on this recorder can only input DVC-SD signals. It cannot output signals.
The DV jack will not accept MICRO MV signals from equipment such as a MICRO MV digital video camera with an i.LINK jack.
For further precautions, see the notes on page 66.
For details on precautions when connecting this recorder, also see the instruction manuals for the equipment to be connected.

Required i.LINK cable

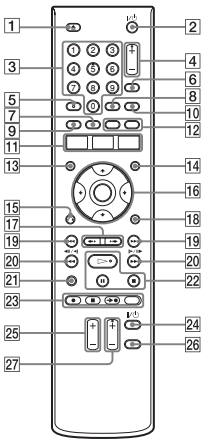
Use the Sony i.LINK 4-pin-to-4-pin cable (during DV/Digital8 dubbing).

i.LINK and i, are trademarks.

Guide to Parts and Controls

For more information, see the pages in parentheses.

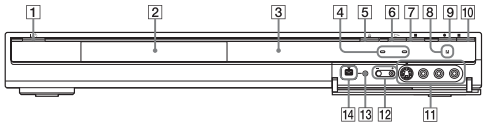
Remote



1 ⏏ OPEN/CLOSE button (27)
2 I/⏻ (on/standby) button (23)
3 Number buttons (54)
The number 5 button has a tactile dot*.
4 CH (channel) +/– buttons (27)
The + button has a tactile dot*.
5 AUDIO button (51)
The AUDIO button has a tactile dot*.
6 INPUT SELECT button (48, 66)
7 MENU button (49)
8 SET button (22)
9 TOP MENU button (49)
10 SUBTITLE button (51)
11 SYSTEM MENU button (68, 71)
TITLE LIST button (28, 49, 60)
TIMER button (40)
12 CHAPTER MARK button (62)
CHAPTER MARK ERASE button (62)
13 DISPLAY button (30)
14 TIMER LIST button (44)
15 RETURN button (44)
16 ←/↑/↓/→/ENTER button (23)
17 ←• REPLAY/ADVANCE •→ buttons (28, 55)
18 OPTIONS button (37)
19 ⏮ PREV/NEXT ⏭ buttons (51)
20 ◀◀/◀II/◀/▶/II▶/▶▶ (search/slow/freeze frame) buttons (51)
21 TIME/TEXT button (30)
22 ▷ PLAY button (49)
II PAUSE button (51)
■ STOP button (49)
The ▷ PLAY button has a tactile dot*.
23 ● REC button (27)
■ REC STOP button (27)
→ ● SYNCHRO REC button (47)
REC MODE button (27)
24 TV I/⏻ (TV on/standby) button (20)
25 TV VOL (TV volume) +/– buttons (20)
26 TV/VIDEO button (20)
27 TV CH (TV channel) +/– buttons (20)
The + button has a tactile dot*.

* Use the tactile dot as a reference when operating the recorder.

Front panel

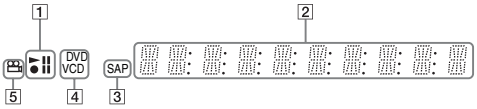


1 I/⏻ (on/standby) button (23)
2 Disc tray (27)
3 Front panel display (31, 94)
4 TIMER REC indicator (40)
SYNCHRO REC indicator (47)
5 ⏏ (open/close) button (27)
6 ▷ (play) button (49)
7 ■ (stop) button (49)
8 (remote sensor) (20)
9 ● REC button (27)
10 ■ REC STOP button (27)
11 LINE 2 IN (S VIDEO/VIDEO/L(MONO) AUDIO R) jacks (25)
12 CHANNEL +/– buttons (27)
The + button has a tactile dot*.
13 ONE-TOUCH DUB button (68)
14 DV IN jack (66)

* Use the tactile dot as a reference when operating the recorder.

→continued

Front panel display

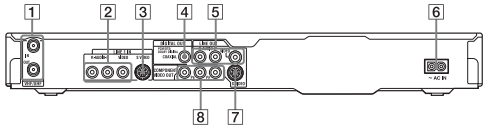


1 Playing/recording status
2 Displays the following (31):
• Playing time/remaining time
• Current title/chapter/track/index number
• Recording time/recording mode
• Clock
• Channel
3 SAP indicator (40)
4 Disc type*
5 (angle) indicator (49)

* Displays DATA CDs as "CD."

Hint
You can turn off the front panel display when the recorder is turned off by setting "Power Save Standby" to "On" in the "Others" setup (page 81).

Rear panel



1 VHF/UHF IN/OUT jacks (12)
2 LINE 1 IN (R-AUDIO-L/VIDEO) jacks (16)
3 LINE 1 IN (S VIDEO) jack (24)
4 DIGITAL OUT (COAXIAL) jack (18)
5 LINE OUT (R-AUDIO-L/VIDEO) jacks (16, 18)
6 AC IN terminal (19)
7 LINE OUT (S VIDEO) jack (16)
8 COMPONENT VIDEO OUT (Y, PB, PR) jacks (16)

Language Code List

For details, see page 80.
The language spellings conform to the ISO 639: 1988 (E/F) standard.

Code	Language	Code	Language	Code	Language	Code	Language
1027	Afar	1183	Irish	1347	Maori	1507	Samoan
1028	Abkhazian	1186	Scots Gaelic	1349	Macedonian	1508	Shona
1032	Afrikaans	1194	Galician	1350	Malayalam	1509	Somali
1039	Amharic	1196	Guarani	1352	Mongolian	1511	Albanian
1044	Arabic	1203	Gujarati	1353	Moldavian	1512	Serbian
1045	Assamese	1209	Hausa	1356	Marathi	1513	Siswati
1051	Aymara	1217	Hindi	1357	Malay	1514	Sesotho
1052	Azerbaijani	1226	Croatian	1358	Maltese	1515	Sundanese
1053	Bashkir	1229	Hungarian	1363	Burmese	1516	Swedish
1057	Byelorussian	1233	Armenian	1365	Nauru	1517	Swahili
1059	Bulgarian	1235	Interlingua	1369	Nepali	1521	Tamil
1060	Bihari	1239	Interlingue	1376	Dutch	1525	Telugu
1061	Bislama	1245	Inupiak	1379	Norwegian	1527	Tajik
1066	Bengali; Bangla	1248	Indonesian	1393	Occitan	1528	Thai
		1253	Icelandic	1403	(Afan)Oromo	1529	Tigrinya
1067	Tibetan	1254	Italian	1408	Oriya	1531	Turkmen
1070	Breton	1257	Hebrew	1417	Punjabi	1532	Tagalog
1079	Catalan	1261	Japanese	1428	Polish	1534	Setswana
1093	Corsican	1269	Yiddish	1435	Pashto; Pushto	1535	Tonga
1097	Czech	1283	Javanese			1538	Turkish
1103	Welsh	1287	Georgian	1436	Portuguese	1539	Tsonga
1105	Danish	1297	Kazakh	1463	Quechua	1540	Tatar
1109	German	1298	Greenlandic	1481	Rhaeto-Romance	1543	Twi
1130	Bhutani	1299	Cambodian			1557	Ukrainian
1142	Greek	1300	Kannada	1482	Kirundi	1564	Urdu
1144	English	1301	Korean	1483	Romanian	1572	Uzbek
1145	Esperanto	1305	Kashmiri	1489	Russian	1581	Vietnamese
1149	Spanish	1307	Kurdish	1491	Kinyarwanda	1587	Volapük
1150	Estonian	1311	Kirghiz	1495	Sanskrit	1613	Wolof
1151	Basque	1313	Latin	1498	Sindhi	1632	Xhosa
1157	Persian	1326	Lingala	1501	Sangho	1665	Yoruba
1165	Finnish	1327	Laothian	1502	Serbo-Croatian	1684	Chinese
1166	Fiji	1332	Lithuanian			1697	Zulu
1171	Faroese	1334	Latvian; Lettish	1503	Singhalese		
1174	French			1505	Slovak		
1181	Frisian	1345	Malagasy	1506	Slovenian	1703	Not specified

Area Code

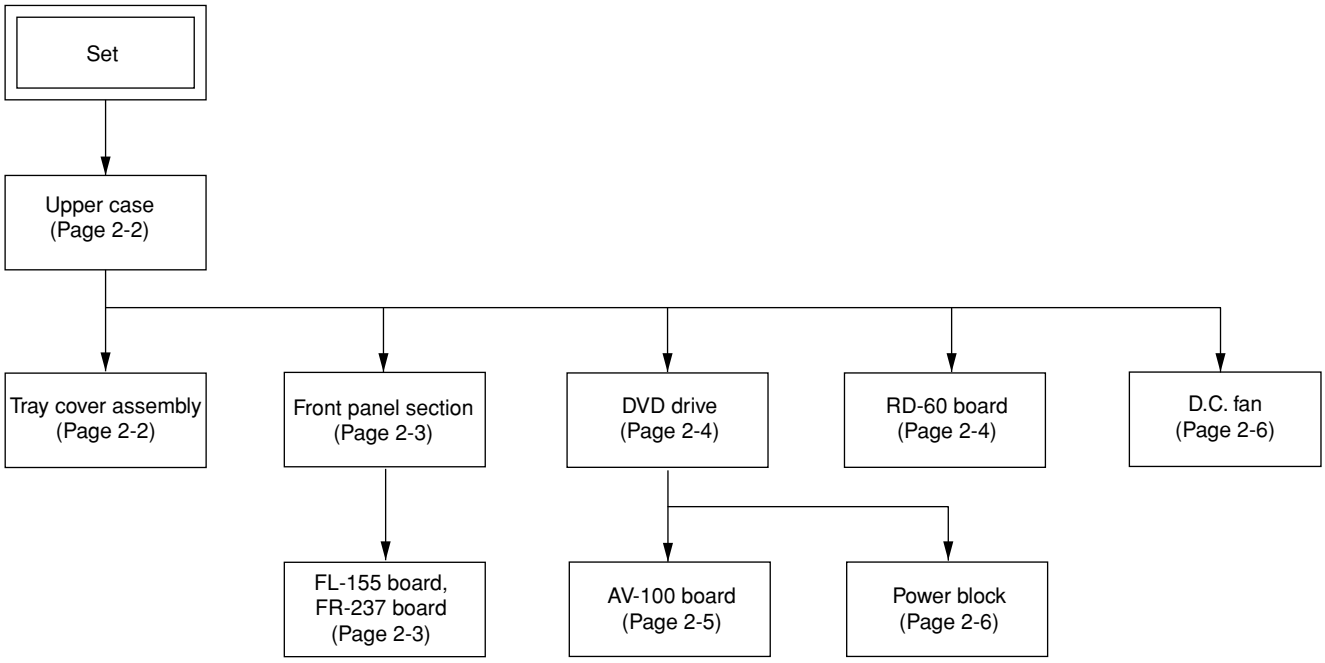
For details, see page 79.

Code	Area	Code	Area	Code	Area	Code	Area
2044	Argentina	2165	Finland	2362	Mexico	2149	Spain
2047	Australia	2174	France	2376	Netherlands	2499	Sweden
2046	Austria	2109	Germany	2390	New Zealand	2086	Switzerland
2057	Belgium	2248	India	2379	Norway	2528	Thailand
2070	Brazil	2238	Indonesia	2427	Pakistan	2184	United Kingdom
2079	Canada	2254	Italy	2424	Philippines		
2090	Chile	2276	Japan	2436	Portugal		
2092	China	2304	Korea	2489	Russia		
2115	Denmark	2363	Malaysia	2501	Singapore		

MEMO

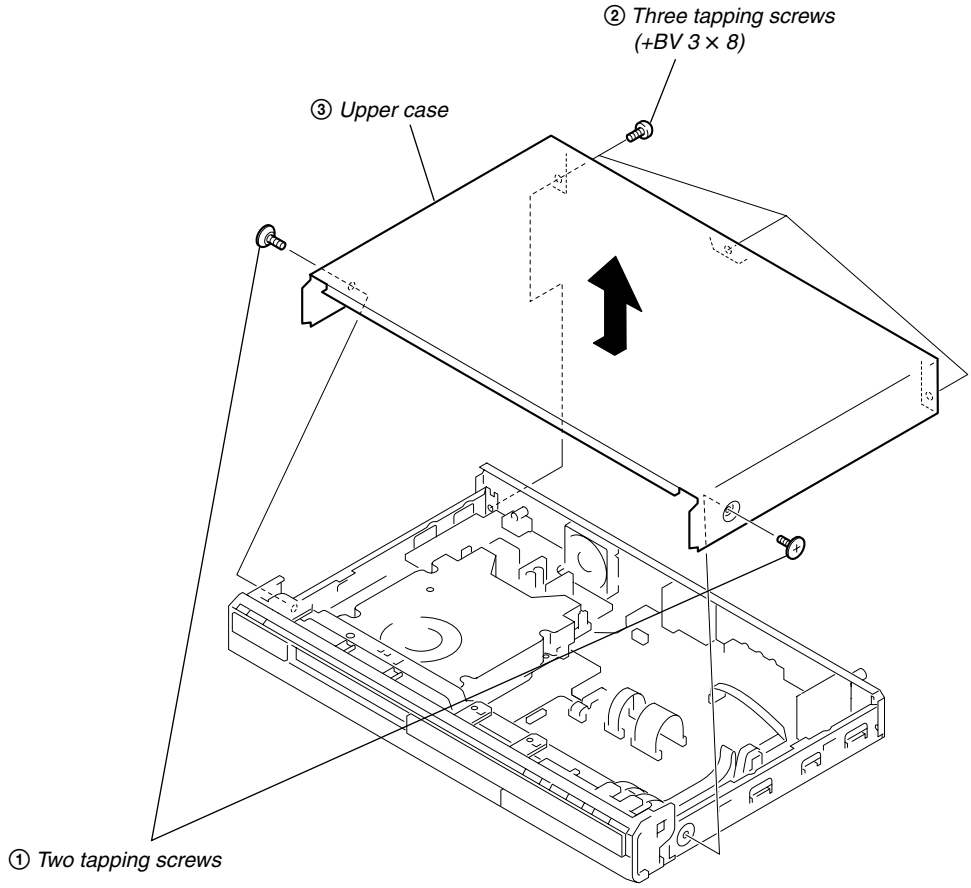
SECTION 2
DISASSEMBLY

NOTE: The following flow chart shows the disassembly procedure.

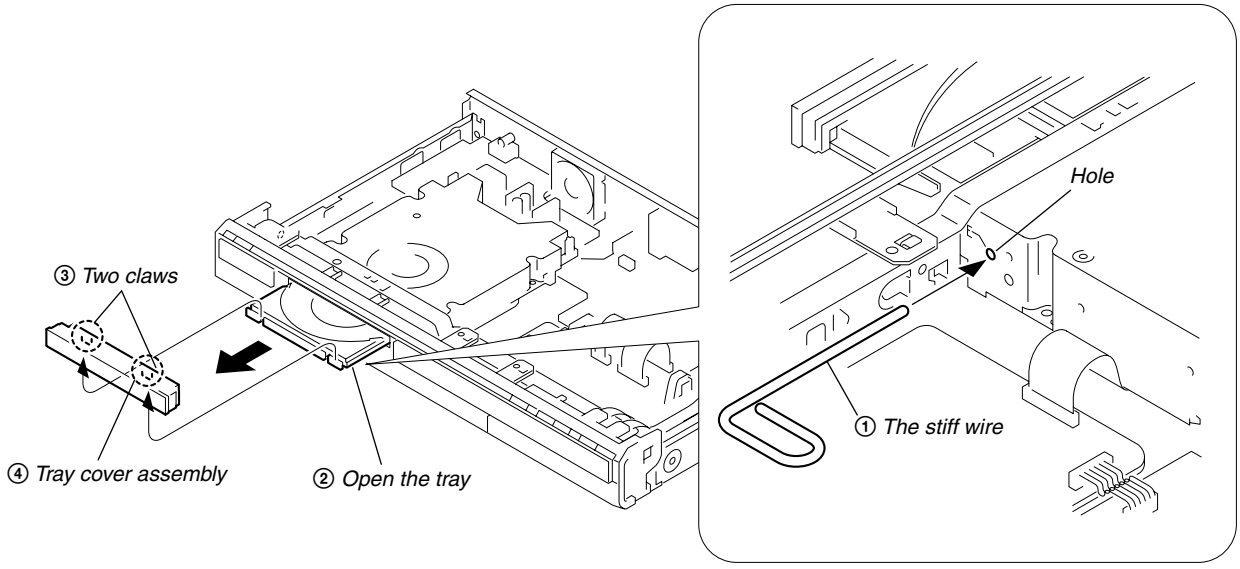


NOTE: Follow the disassembly procedure in the numerical order given.

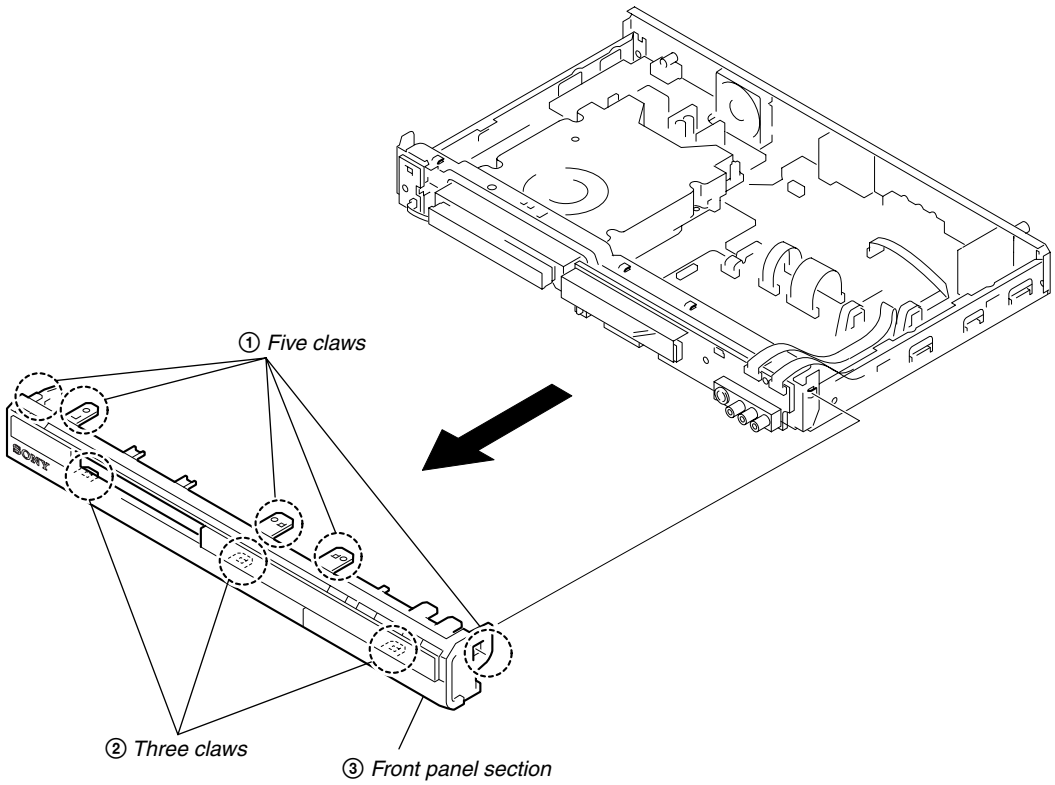
2-1. UPPER CASE



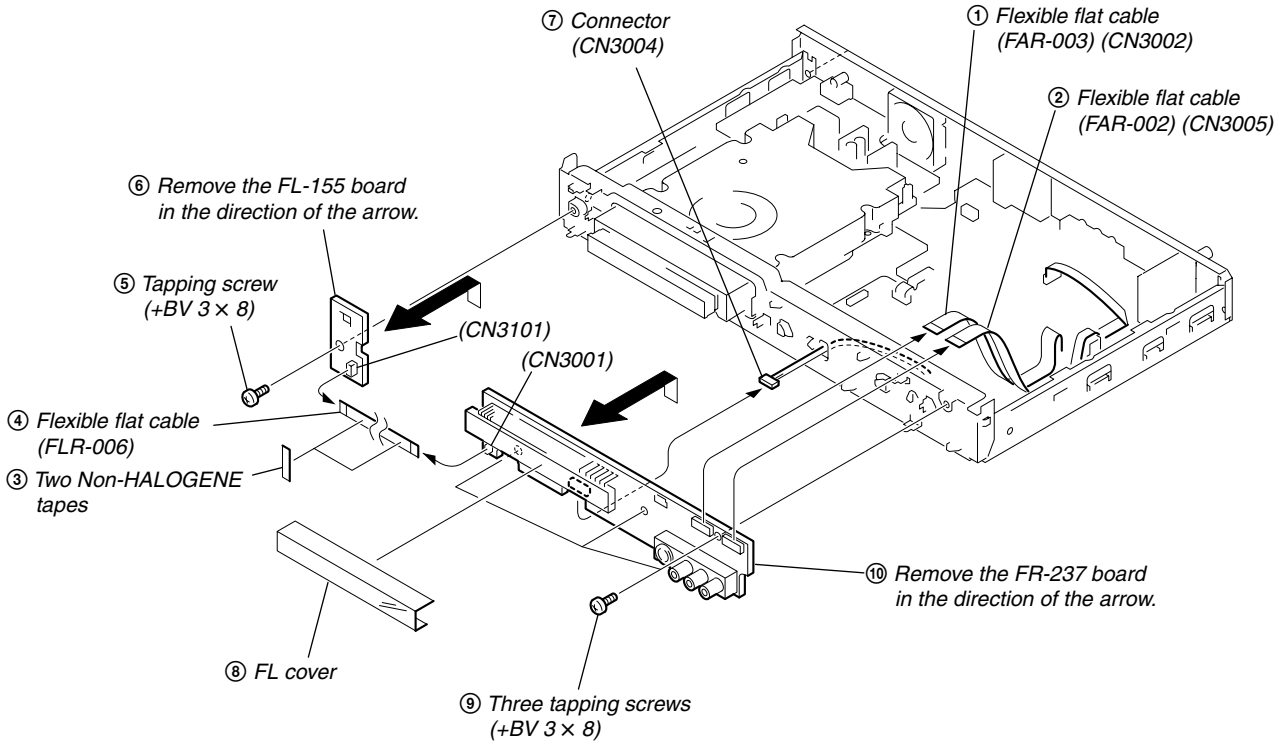
2-2. TRAY COVER ASSEMBLY



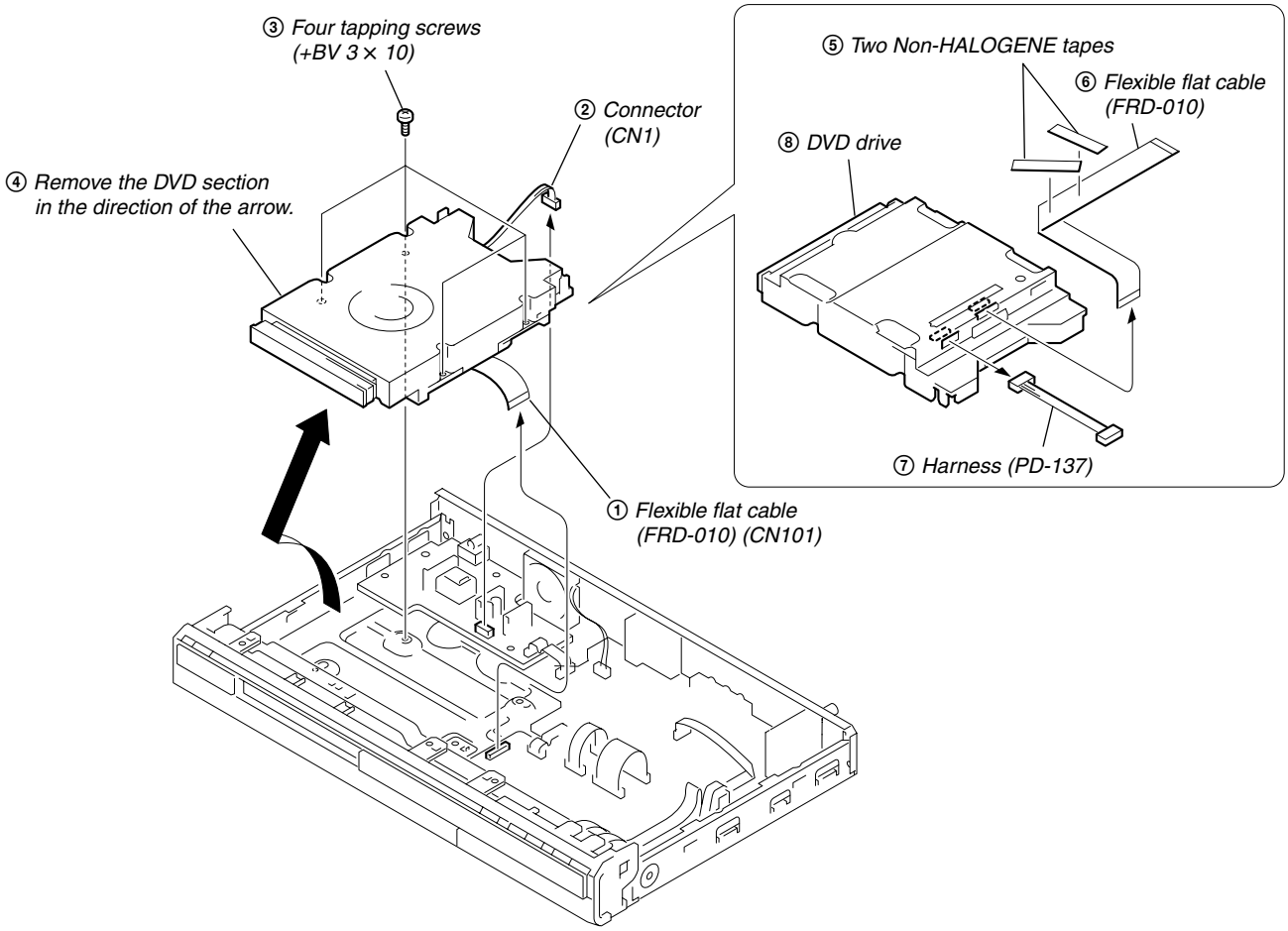
2-3. FRONT PANEL SECTION



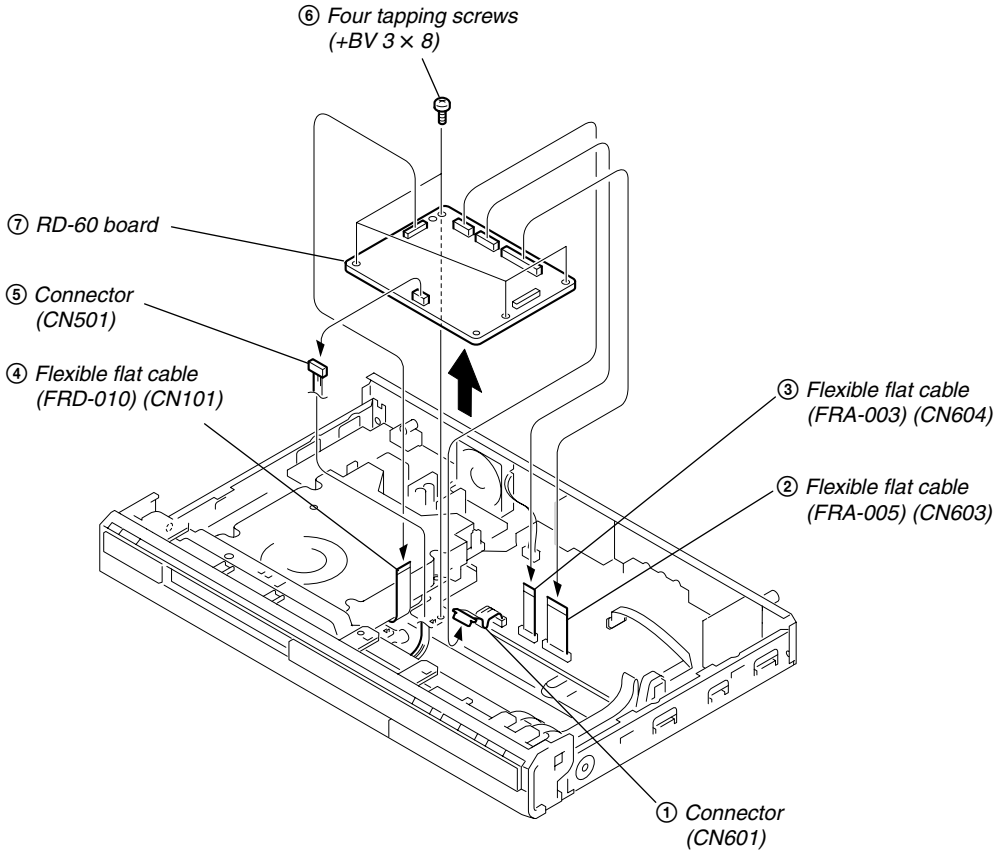
2-4. FL-155 BOARD, FR-237 BOARD


⑦ Connector (CN3004)
① Flexible flat cable (FAR-003) (CN3002)
② Flexible flat cable (FAR-002) (CN3005)
⑥ Remove the FL-155 board in the direction of the arrow.
⑤ Tapping screw (+BV 3 × 8)
(CN3101)
(CN3001)
④ Flexible flat cable (FLR-006)
③ Two Non-HALOGENE tapes
⑩ Remove the FR-237 board in the direction of the arrow.
⑧ FL cover
⑨ Three tapping screws (+BV 3 × 8)

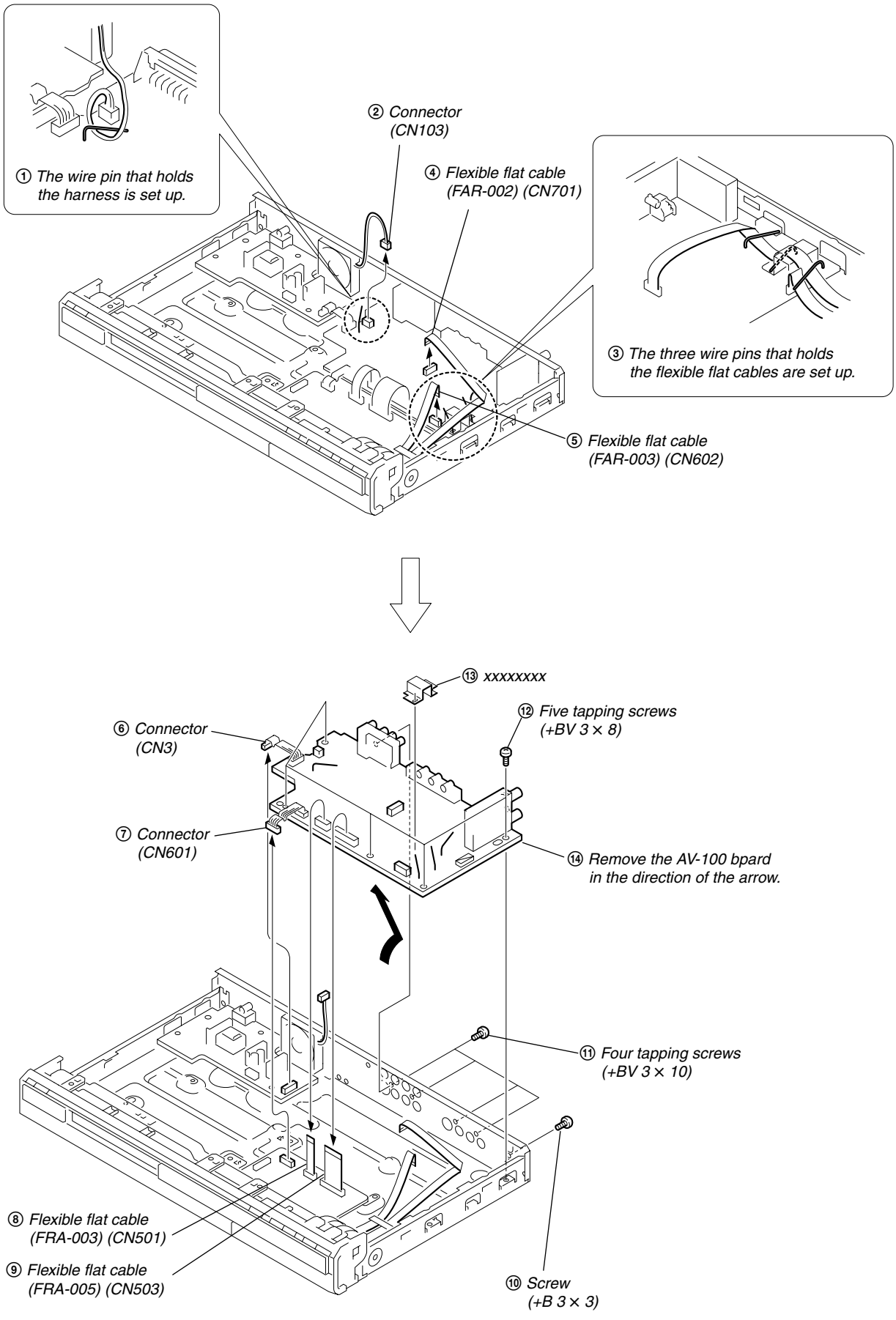
2-5. DVD drive



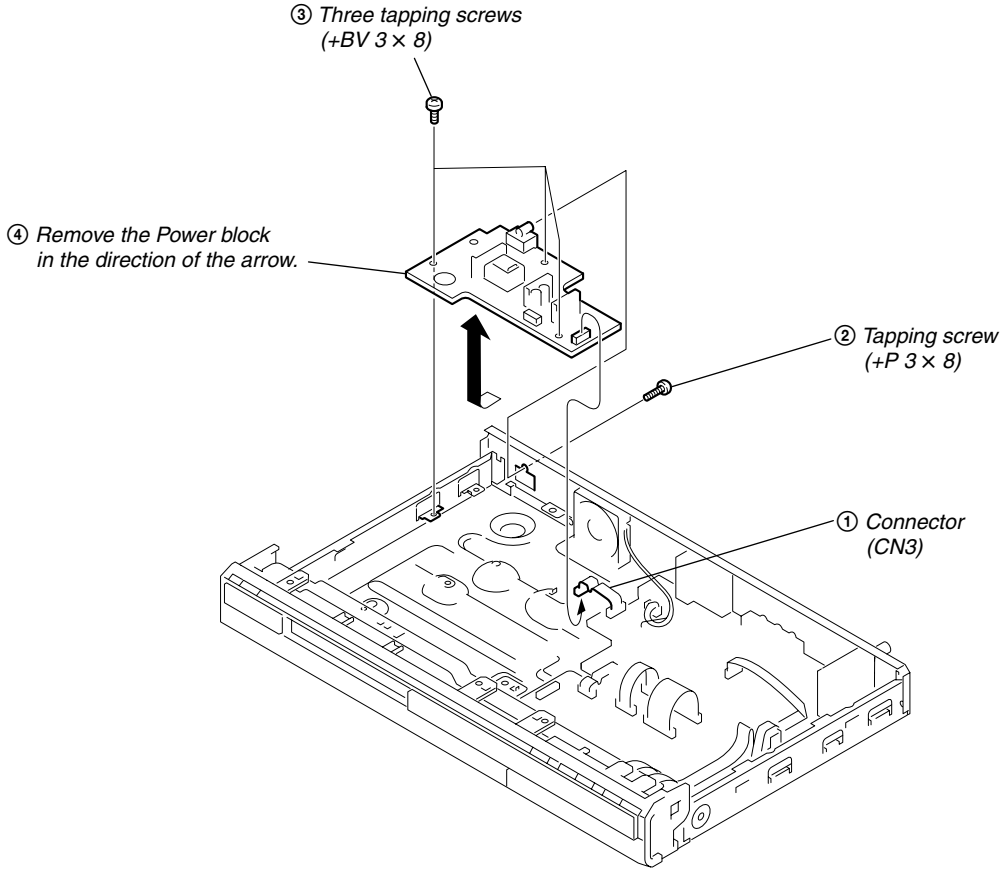
2-6. RD-60 BOARD



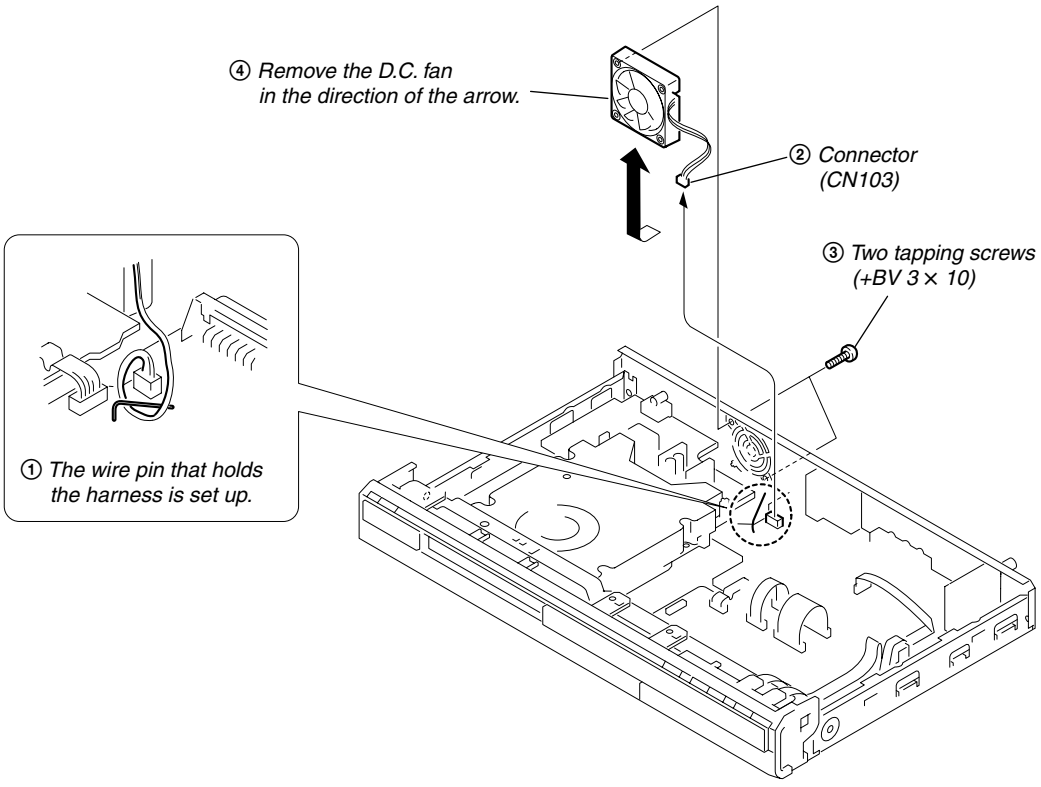
2-7. AV-100 BOARD


① The wire pin that holds the harness is set up.
② Connector (CN103)
③ The three wire pins that holds the flexible flat cables are set up.
④ Flexible flat cable (FAR-002) (CN701)
⑤ Flexible flat cable (FAR-003) (CN602)
⑥ Connector (CN3)
⑦ Connector (CN601)
⑧ Flexible flat cable (FRA-003) (CN501)
⑨ Flexible flat cable (FRA-005) (CN503)
⑩ Screw (+B 3 × 3)
⑪ Four tapping screws (+BV 3 × 10)
⑫ Five tapping screws (+BV 3 × 8)
⑬ xxxxxxxx
⑭ Remove the AV-100 bpard in the direction of the arrow.

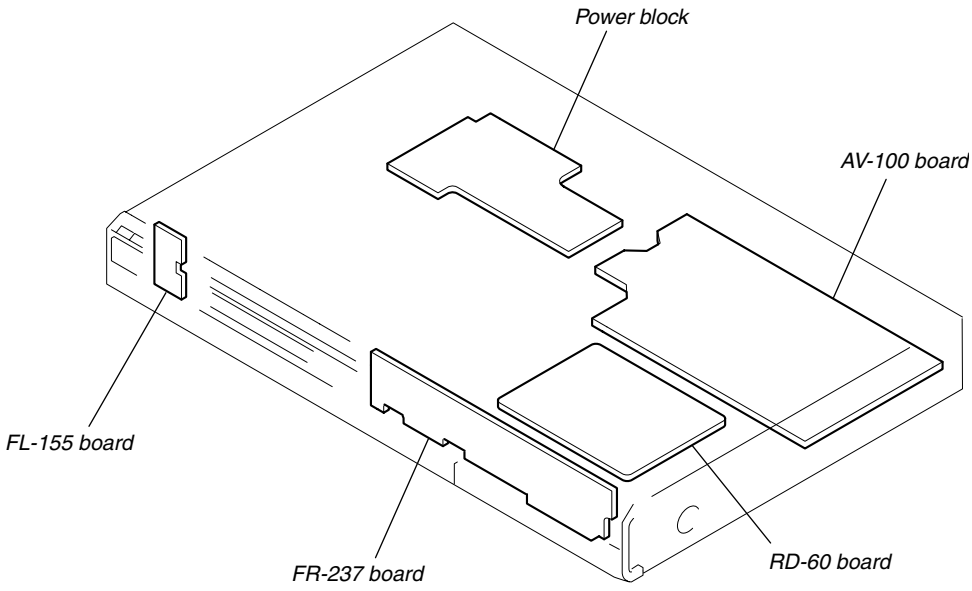
2-8. Power block



2-9. D. C. FAN


④ Remove the D.C. fan
in the direction of the arrow.
② Connector
(CN103)
③ Two tapping screws
(+BV 3 × 10)
① The wire pin that holds
the harness is set up.

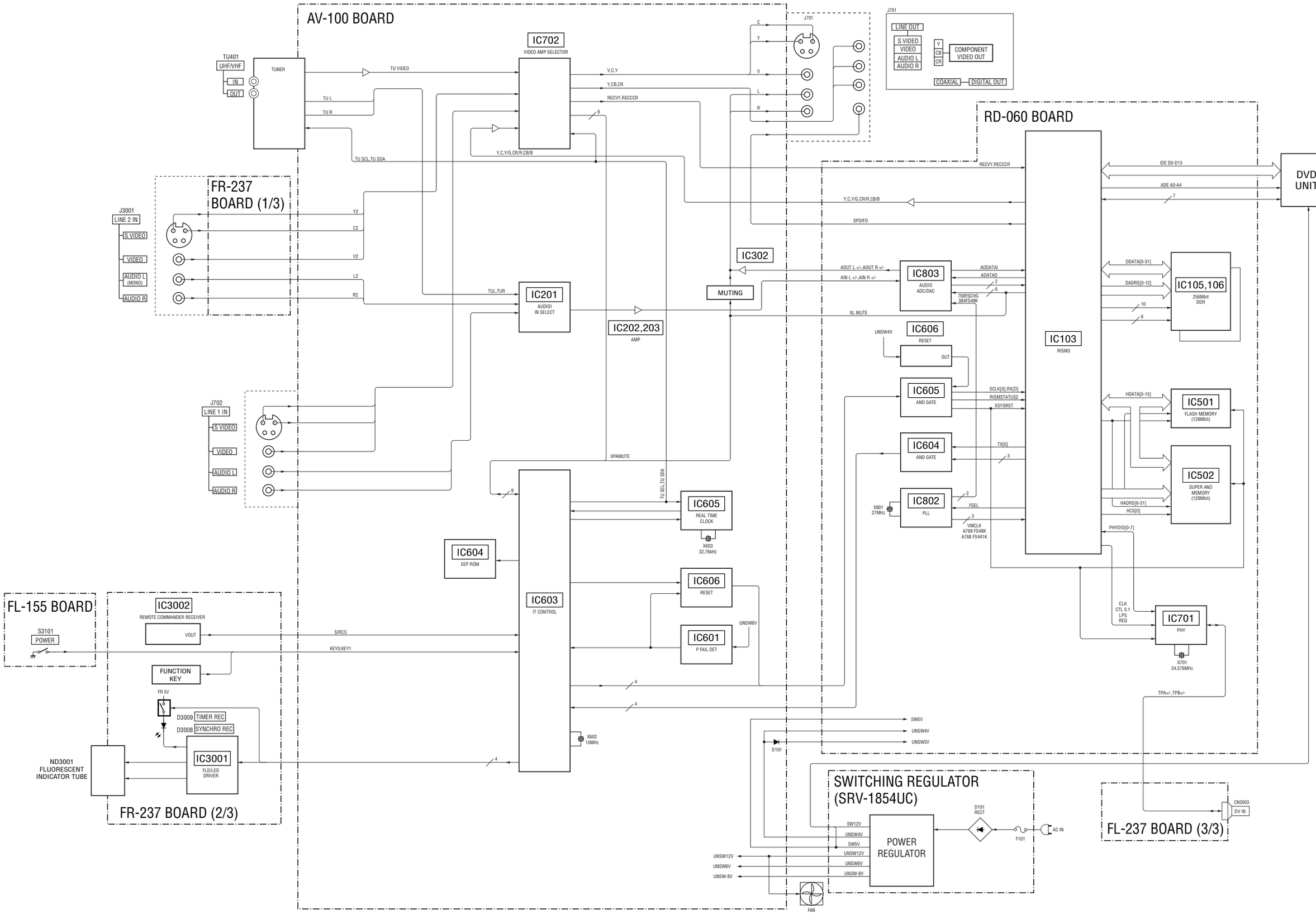
2-10. CIRCUIT BOARDS LOCATION



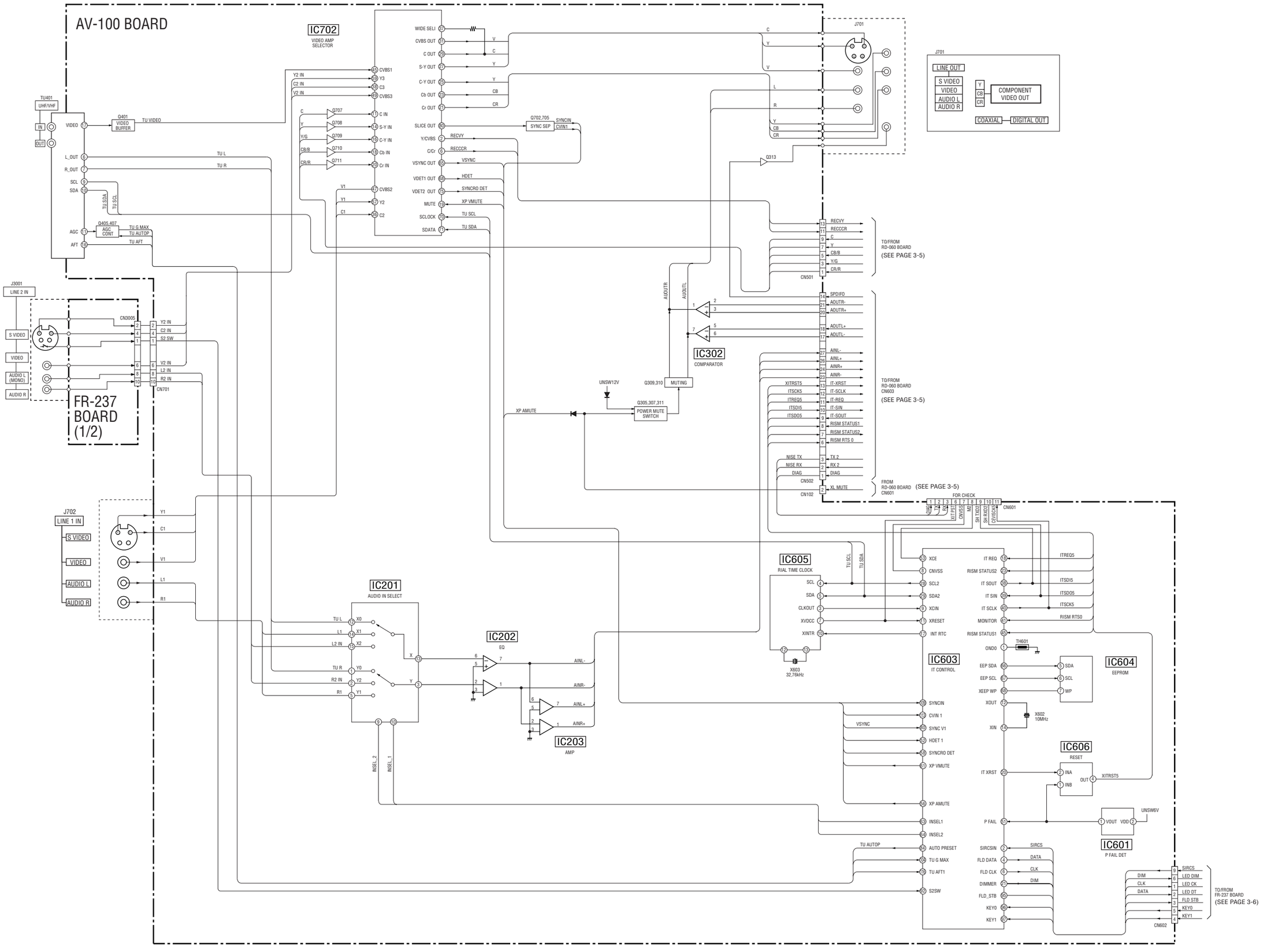
MEMO

SECTION 3
BLOCK DIAGRAMS

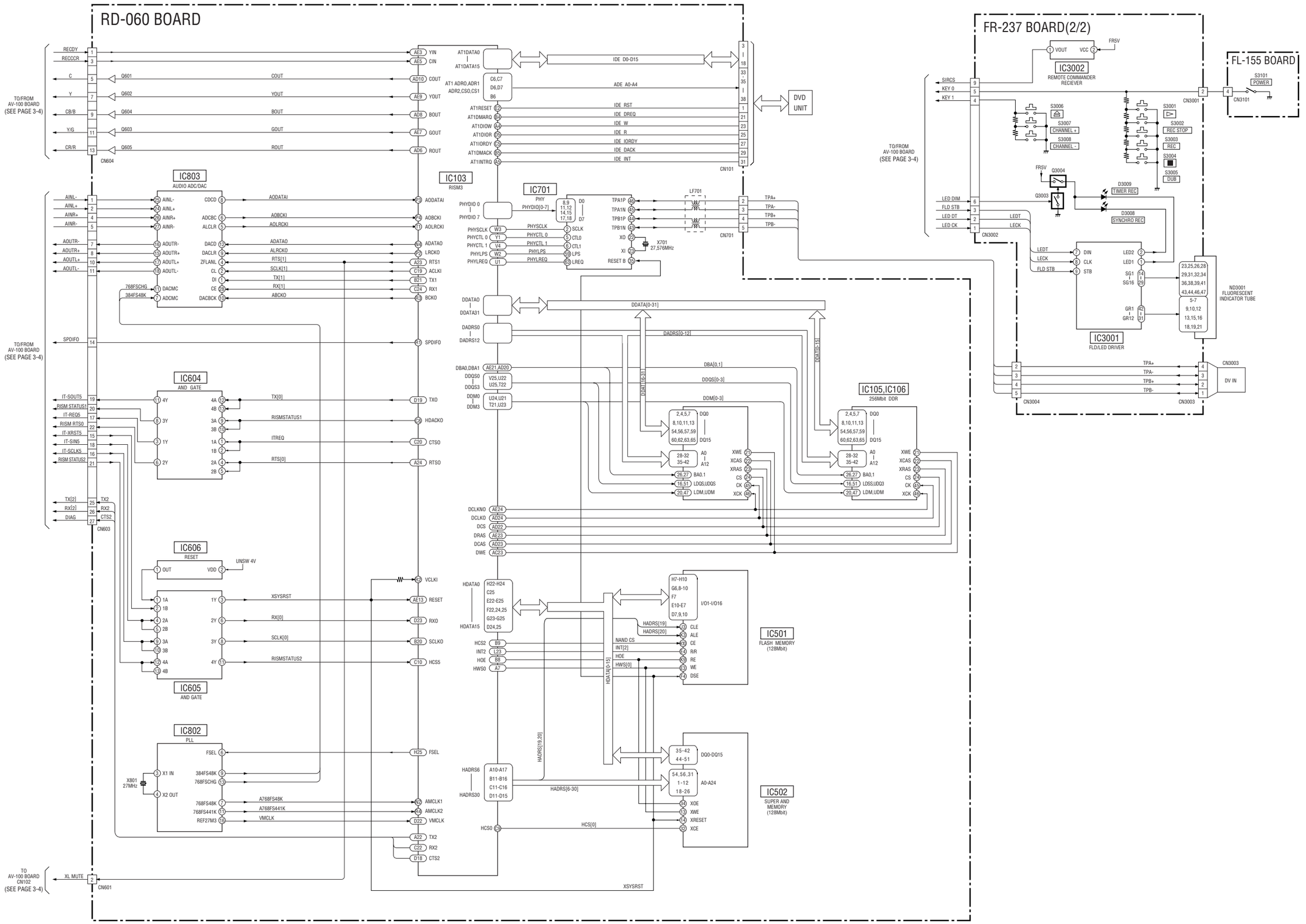
3-1. OVERALL BLOCK DIAGRAM



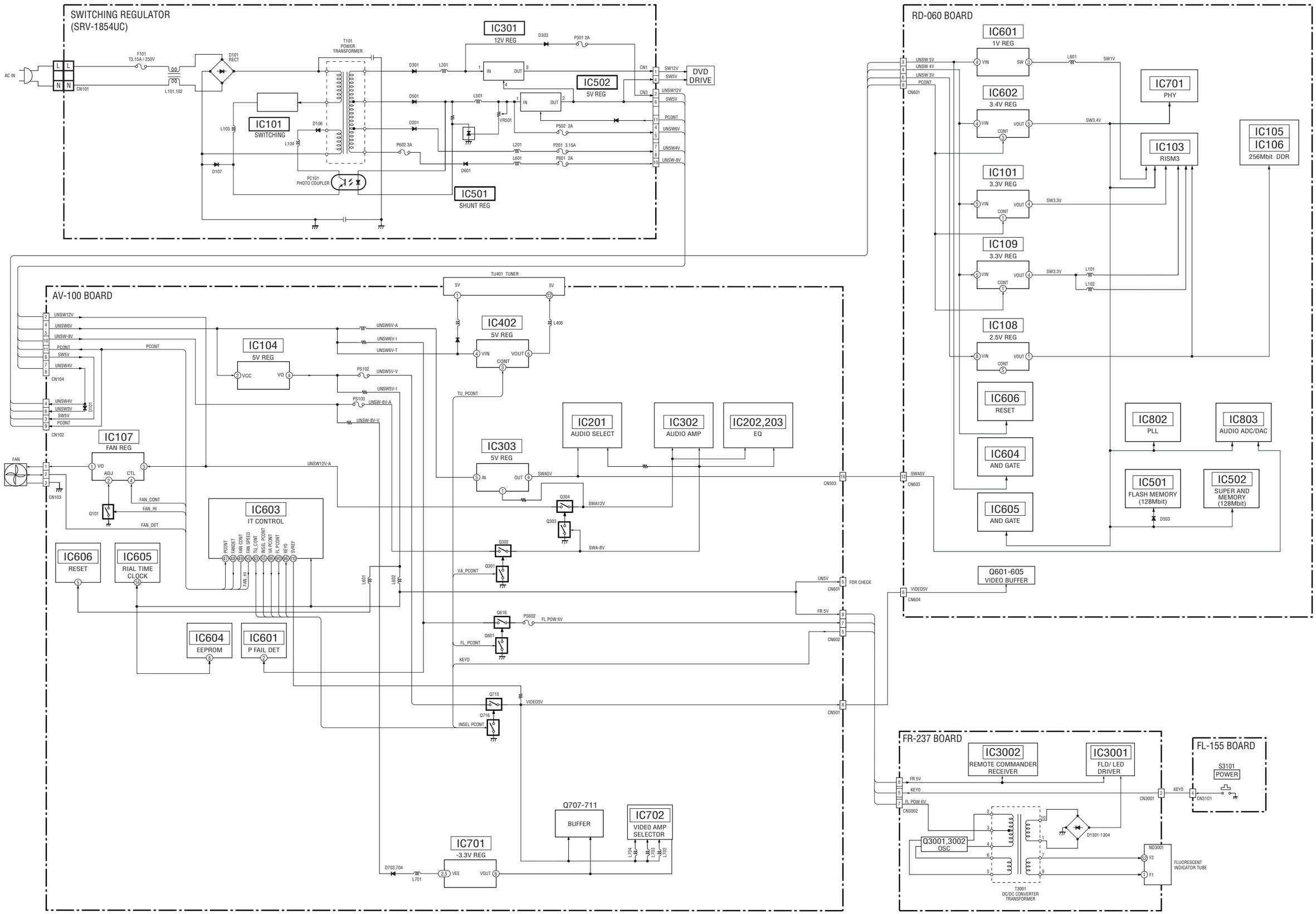
3-2. AV-100 BLOCK DIAGRAM



3-3. RD-060 BLOCK DIAGRAM

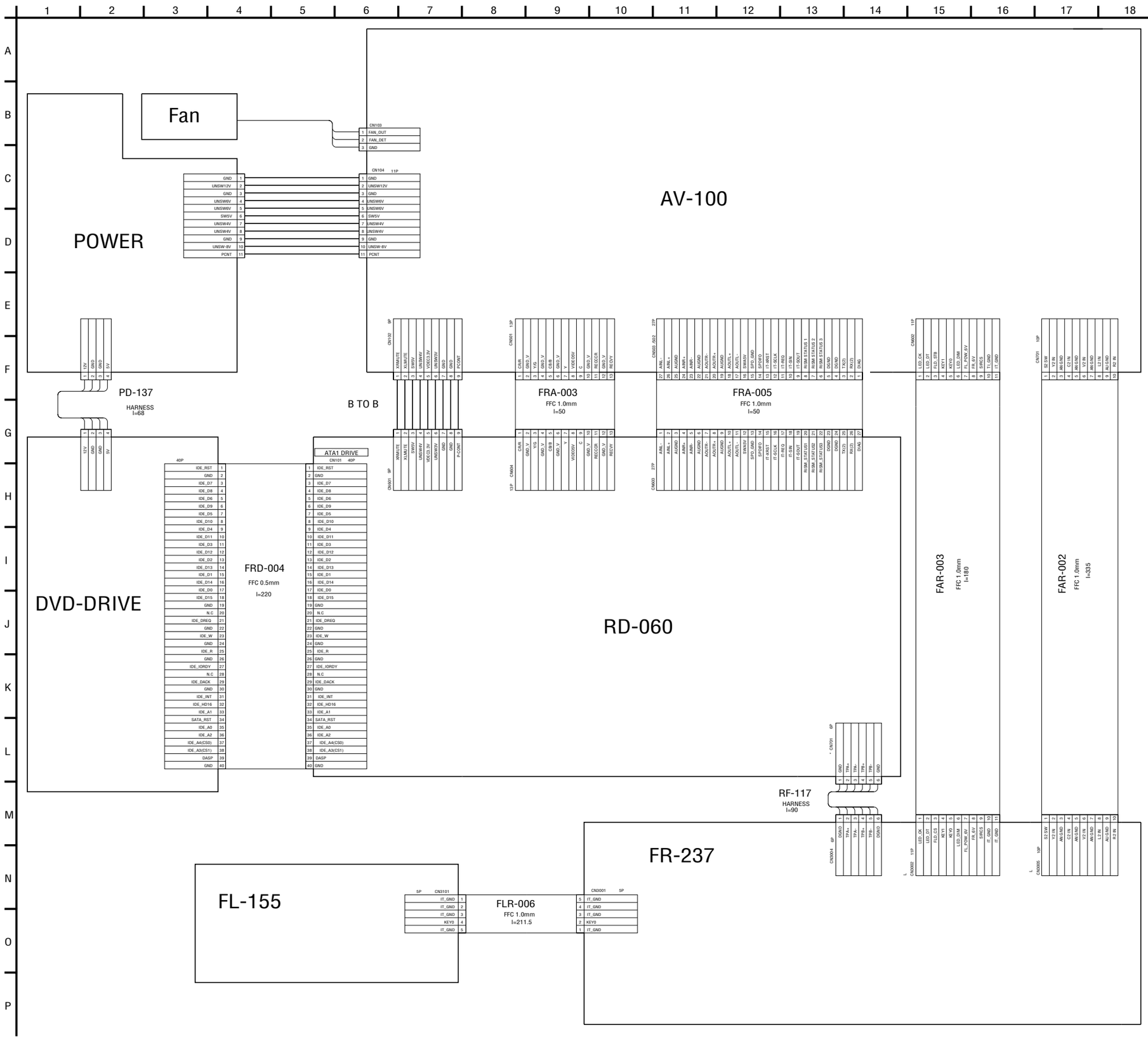


3-4. POWER BLOCK DIAGRAM



SECTION 4
SCHEMATIC DIAGRAMS AND PRINTED WIRING BOARDS

4-1. FRAME SCHEMATIC DIAGRAM



4-2. SCHEMATIC DIAGRAMS

THIS NOTE IS COMMON FOR SCHEMATIC DIAGRAMS
(In addition to this, the necessary note is printed in each block)

(For schematic diagrams)

- All capacitors are in μF unless otherwise noted. pF : μμF. 50V or less are not indicated except for electrolytics and tantalums.
- All resistors are in ohms, 1/4 W (Chip resistors : 1 /10 W) un-less otherwise specified.
  kΩ=1000Ω, MΩ=1000kΩ.
- Caution when replacing chip parts.
  New parts must be attached after removal of chip.
  Be careful not to heat the minus side of tantalum capacitor, be-cause it is damaged by the heat.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- : non flammable resistor
- : fusible resistor
- : panel designation
- △ : internal component.
- : adjustment for repair.
- B + : B+ Line
- B − : B– Line
- Circled numbers refer to waveforms.
- Voltages are dc between measurement point.
- Readings are taken with a color-bar signals on DVD reference disc.
- Readings are taken with a digital multimeter (DC 10MW).
- Voltage variations may be noted due to normal production toler-ances.

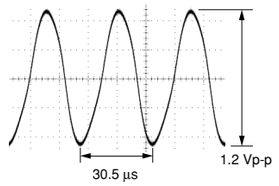
Note :	The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
Note :	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

When indicating parts by reference number, please include the board name.

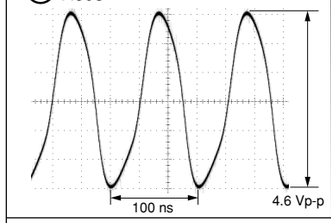
WAVEFORMS

AV-100 BOARD

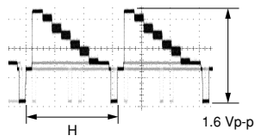
① X602



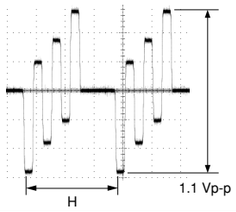
② X603



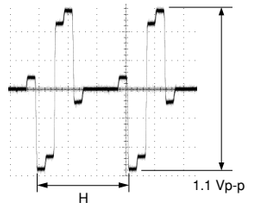
③ J701 COMPONENT Y



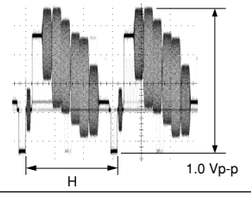
④ J701 COMPONENT PB



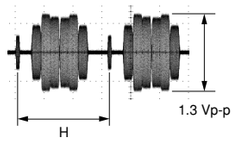
⑤ J701 COMPONENT PR



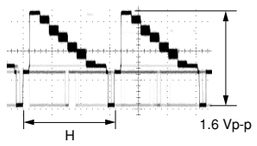
⑥ J701 VIDEO



⑦ J701 S-VIDEO C

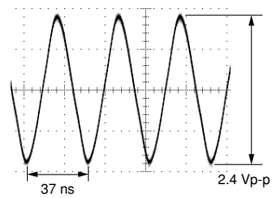


⑧ J701 S-VIDEO Y



RD-060 BOARD

① X801

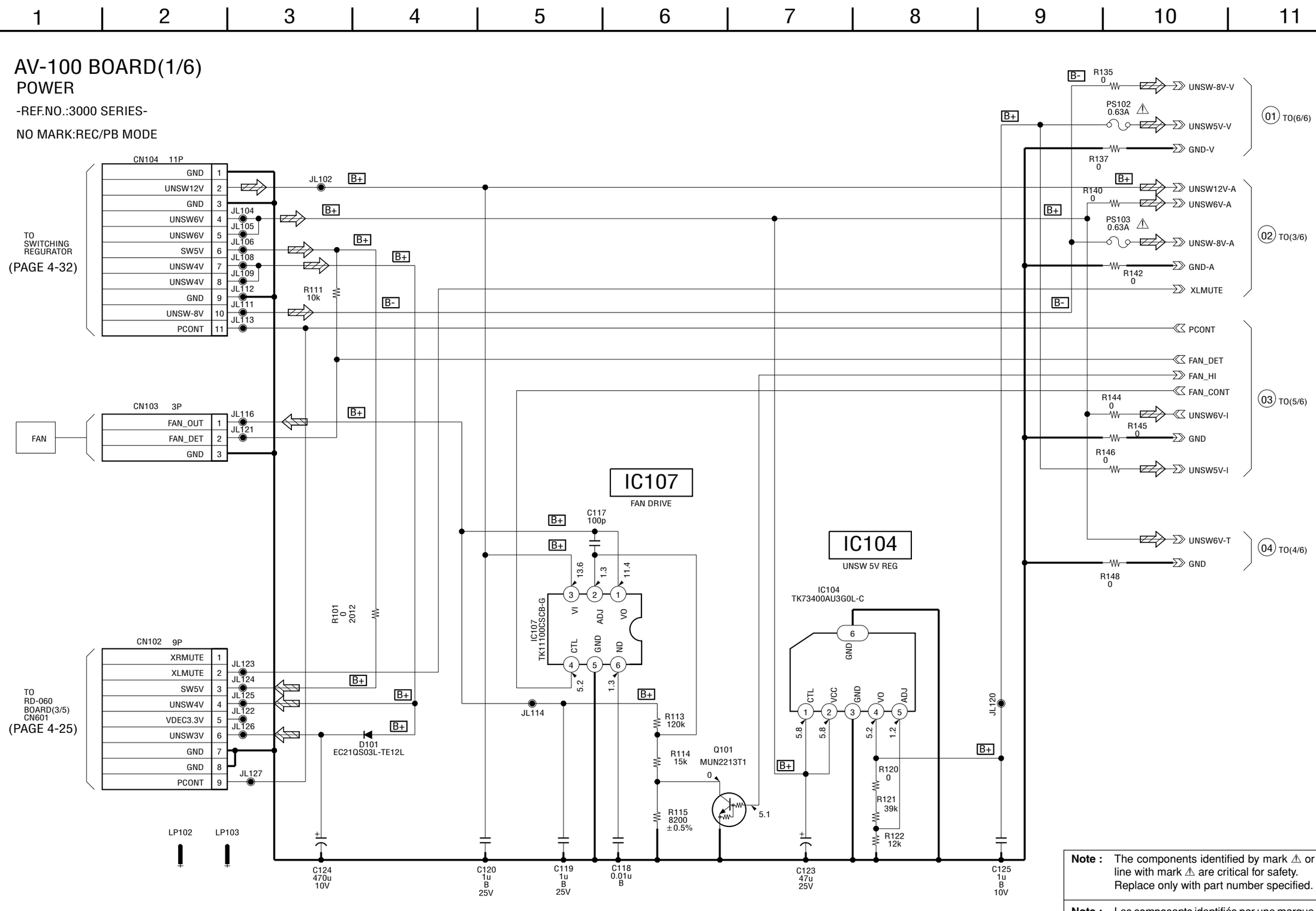


AV-100 BOARD(1/6)

POWER

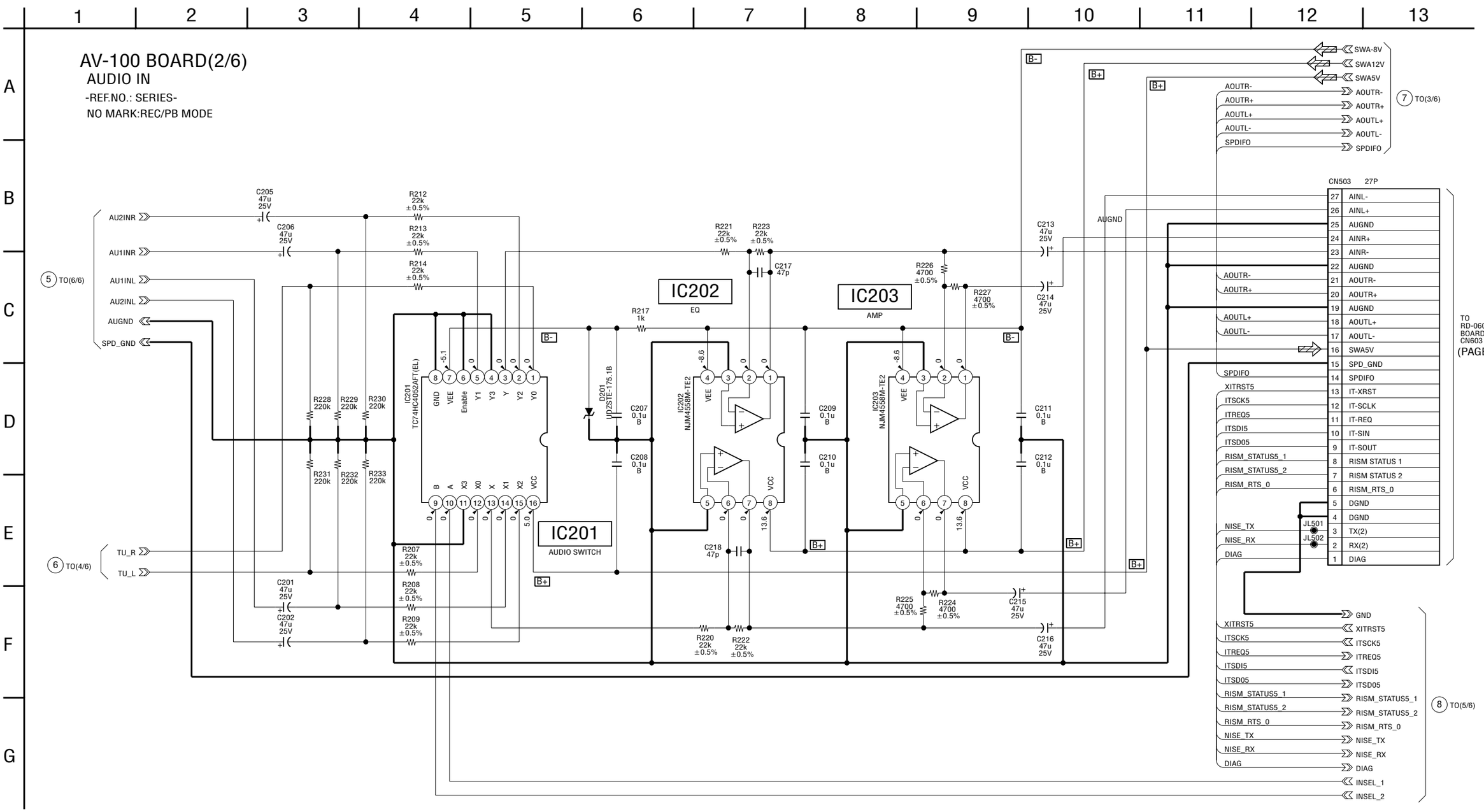
-REF.NO.:3000 SERIES-

NO MARK:REC/PB MODE



Note : The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

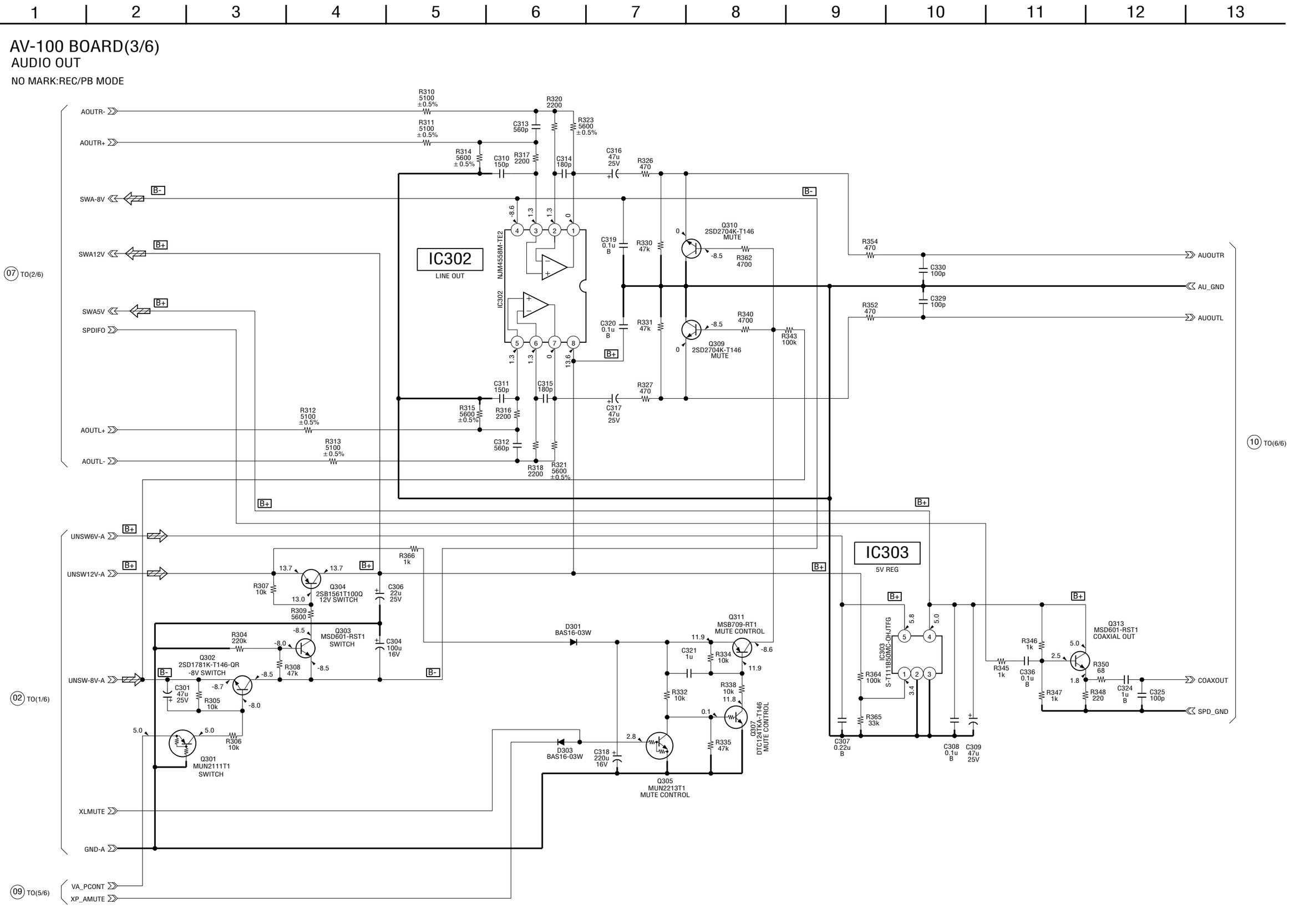
Note : Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.


AV-100 BOARD(2/6)
AUDIO IN
-REF.NO.: SERIES-
NO MARK:REC/PB MODE
IC202
EQ
IC203
AMP
IC201
AUDIO SWITCH
IC201 TC74HC4052AFT(EL)
IC202 NJM4558M-TE2
IC203 NJM4558M-TE2
D201 UDZSTE-175.1B
AU2INR
AU1INR
AU1INL
AU2INL
AUGND
SPD_GND
TU_R
TU_L
5 TO(6/6)
6 TO(4/6)
7 TO(3/6)
8 TO(5/6)
B+
B-
SWA-8V
SWA12V
SWA5V
AOUTR-
AOUTR+
AOUTL+
AOUTL-
SPDIFO
CN503 27P
TO RD-060 BOARD(3/5) CN603 (PAGE 4-26)
JL501
JL502
XITRST5
ITSCK5
ITREQ5
ITSDI5
ITSD05
RISM_STATUS5_1
RISM_STATUS5_2
RISM_RTS_0
NISE_TX
NISE_RX
DIAG
INSEL_1
INSEL_2

AV-100 BOARD(3/6)

AUDIO OUT

NO MARK:REC/PB MODE

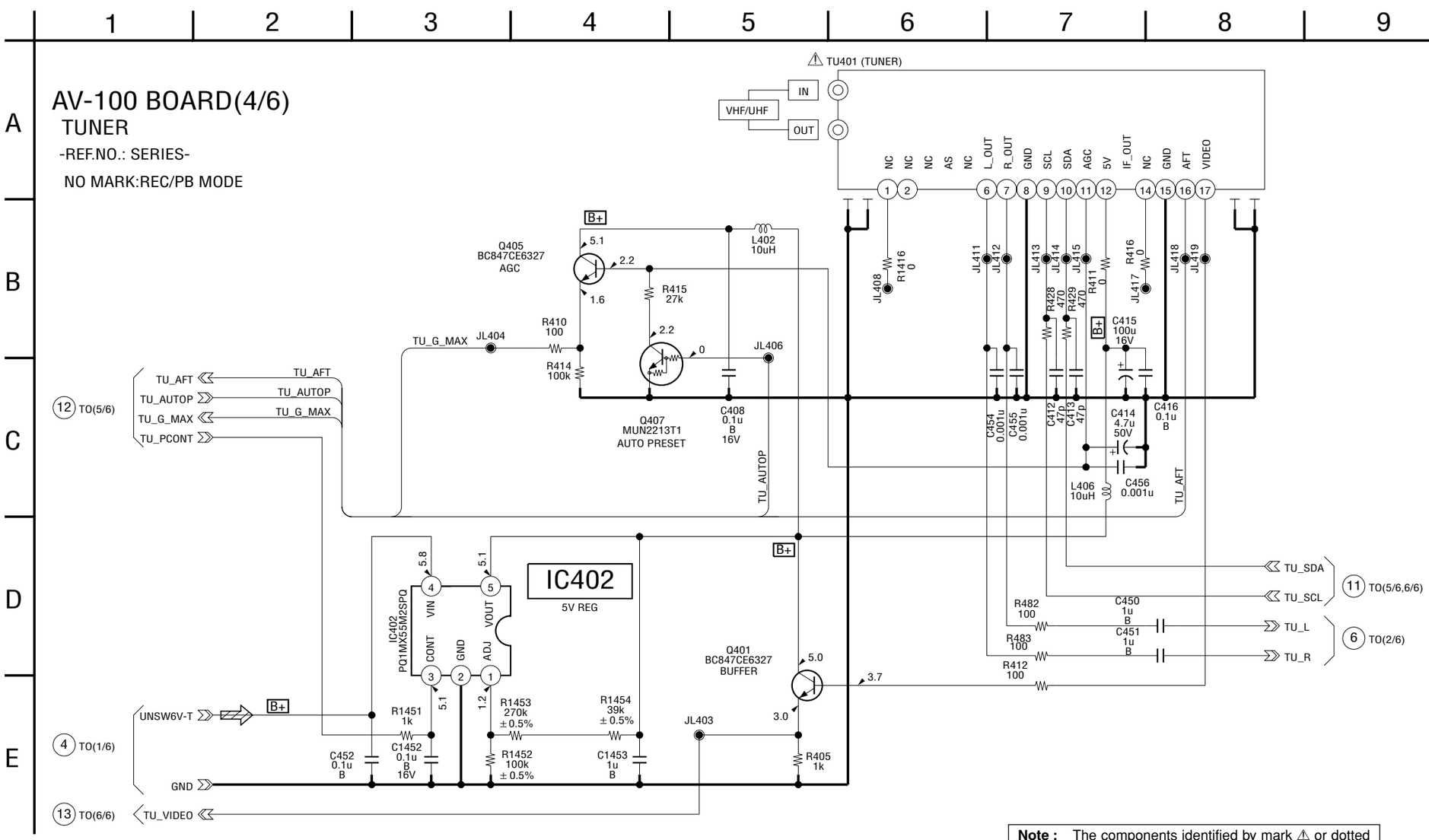


AV-100 BOARD(4/6)

TUNER

-REF.NO.: SERIES-

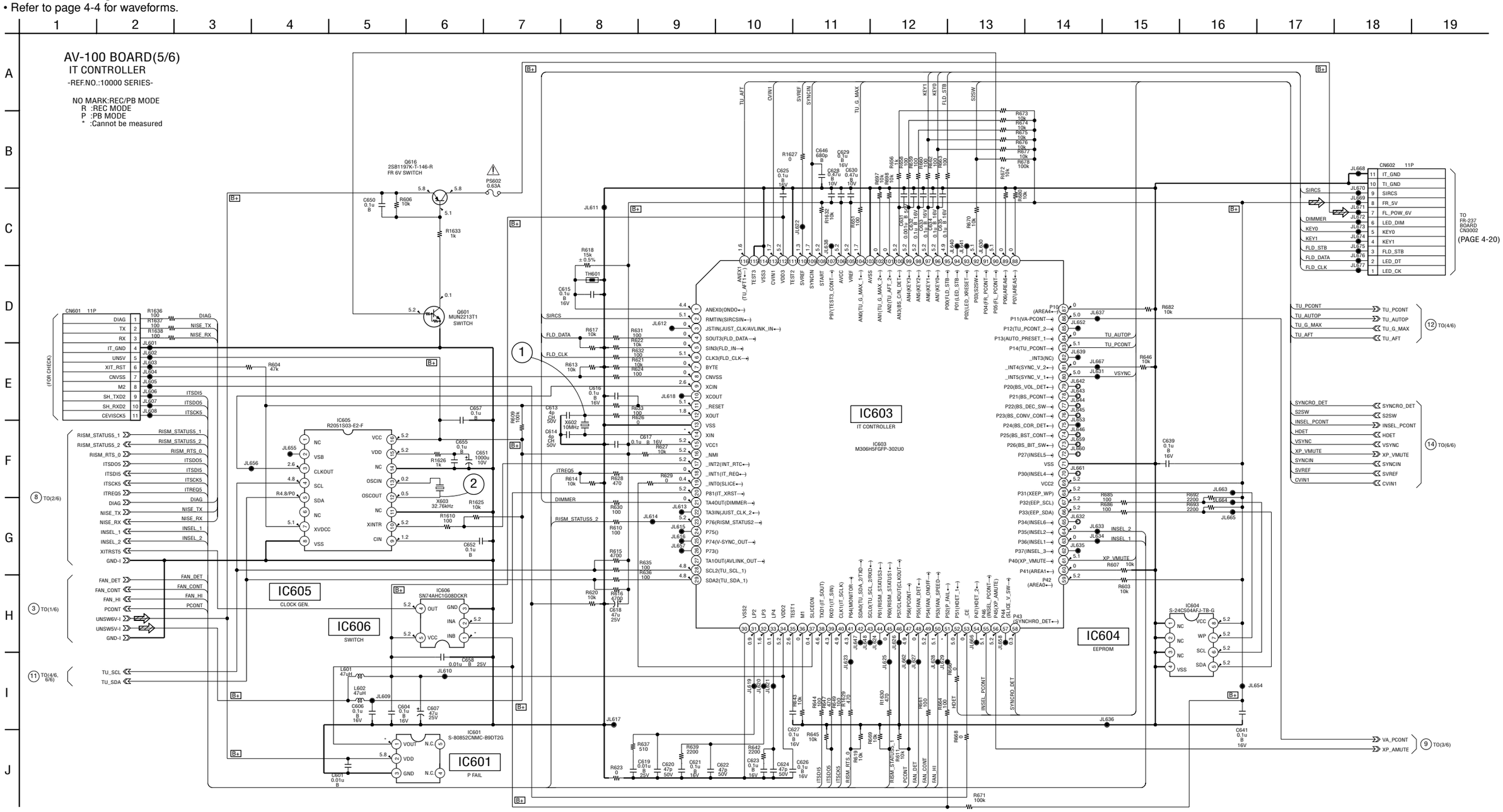
NO MARK:REC/PB MODE



Note :	The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
Note :	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

For Schematic Diagram

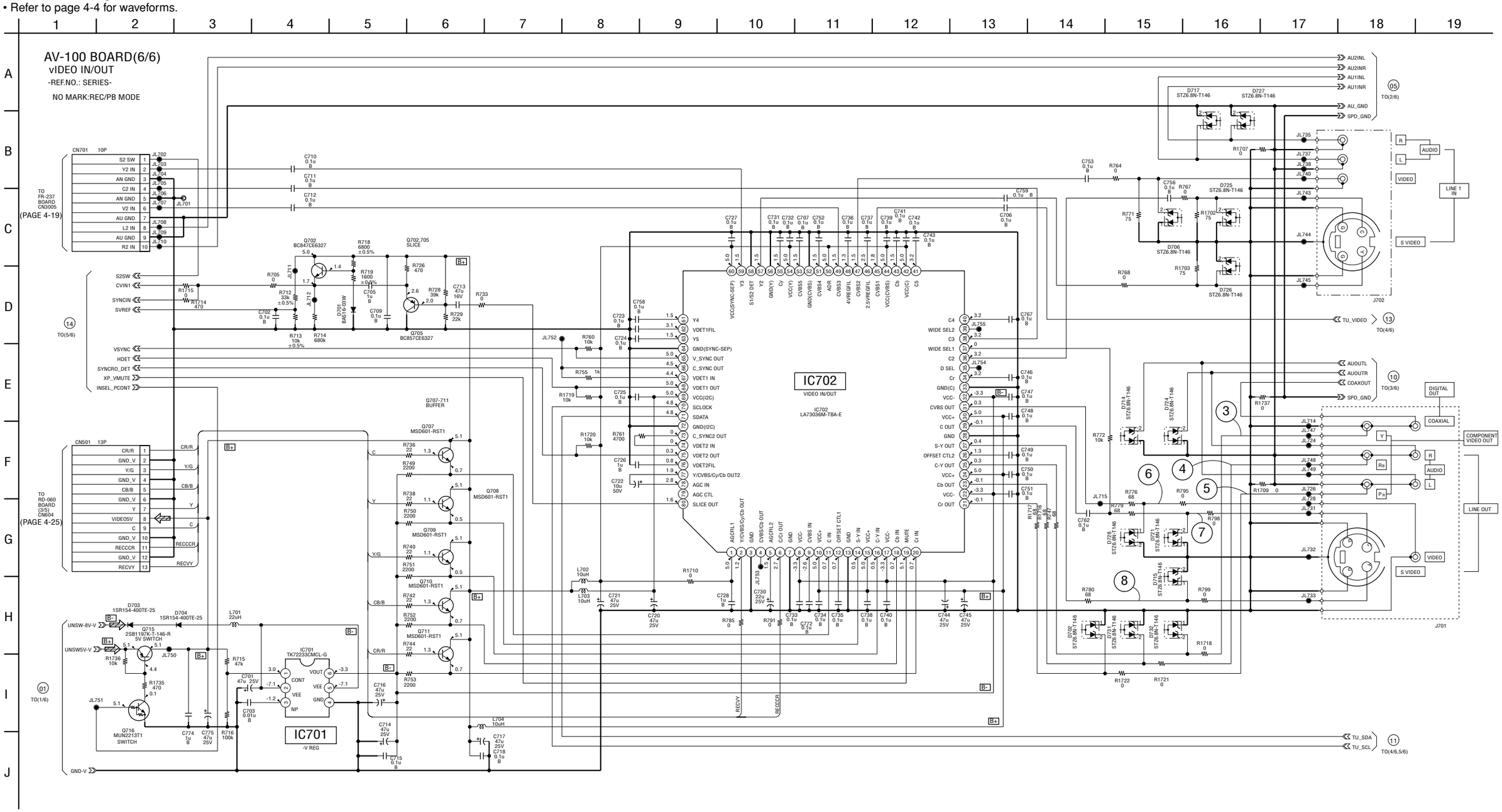
• Refer to page 4-4 for waveforms.

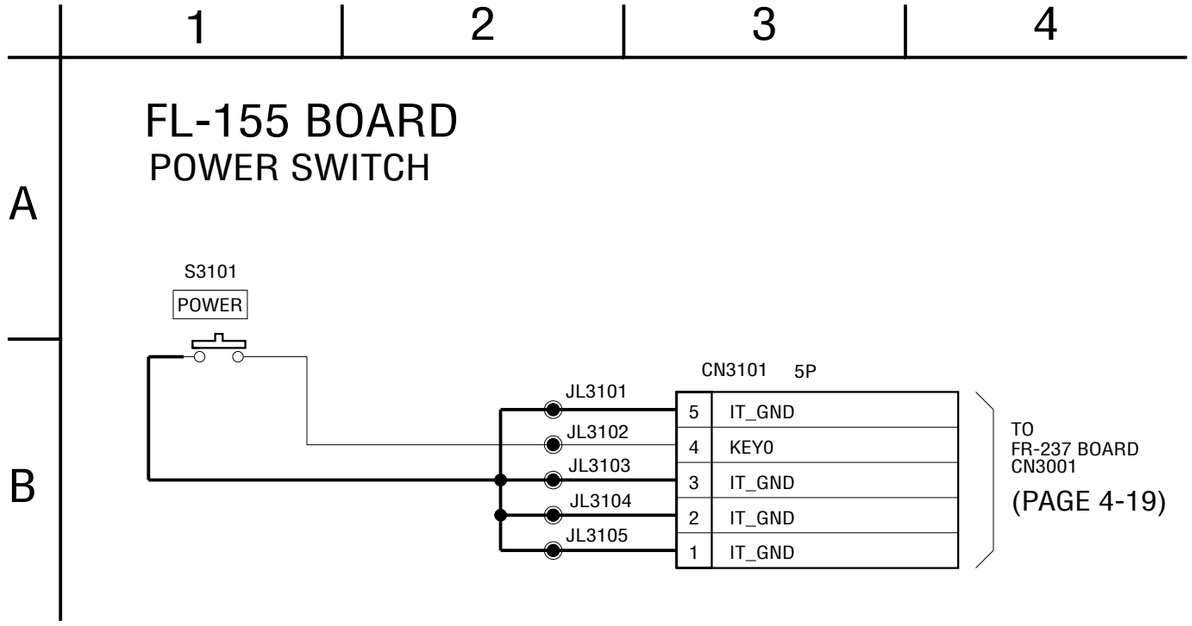


Note :	The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
Note :	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

For Schematic Diagram

• Refer to page 4-4 for waveforms.




1
2
3
4
A
B
FL-155 BOARD
POWER SWITCH
S3101
POWER
JL3101
JL3102
JL3103
JL3104
JL3105
CN3101 5P
5 IT_GND
4 KEY0
3 IT_GND
2 IT_GND
1 IT_GND
TO
FR-237 BOARD
CN3001
(PAGE 4-19)

FR-237 BOARD

FL DRIVE,LINE2 IN,FUNCTION SW

-REF.NO.:1000 SERIES-

NO MARK:REC/PB MODE

ND3001 (FLUORESCENT TUBE DISPLAY)

IC3001
FL DRIVER
IC3001
PT6315

IC3002
REMOTO CONTROL RECEIVER
IC3002
GP1UM26XK0SF

CN3001 5P
CN3002 11P
CN3003 4P
CN3004 6P
CN3005 10P

TO FL-155 BOARD CN3101 (PAGE 4-17)

TO AV-100 BOARD(6/6) CN701 (PAGE 4-15)

TO AV-100 BOARD(5/6) CN602 (PAGE 4-14)

TO RD-060 BOARD(4/5) CN701 (PAGE 4-28)

S VIDEO
LINE 2 IN
VIDEO
AUDIO L
AUDIO R

SYNCHRO REC
TIMER REC
DV IN

For Schematic Diagram

• Refer to page 4-33 for printed wiring board.

RD-060 BOARD(1/5)
RISM3
-REF.NO.: SERIES-
NO MARK:REC/PB MODE

▲:Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.

IC101 3.3V REG
IC103 RISM3 ▲IC103 RBA340128G
IC105 512Mbit DDR
IC106 512Mbit DDR
IC108 REG
IC109 3.3V REG

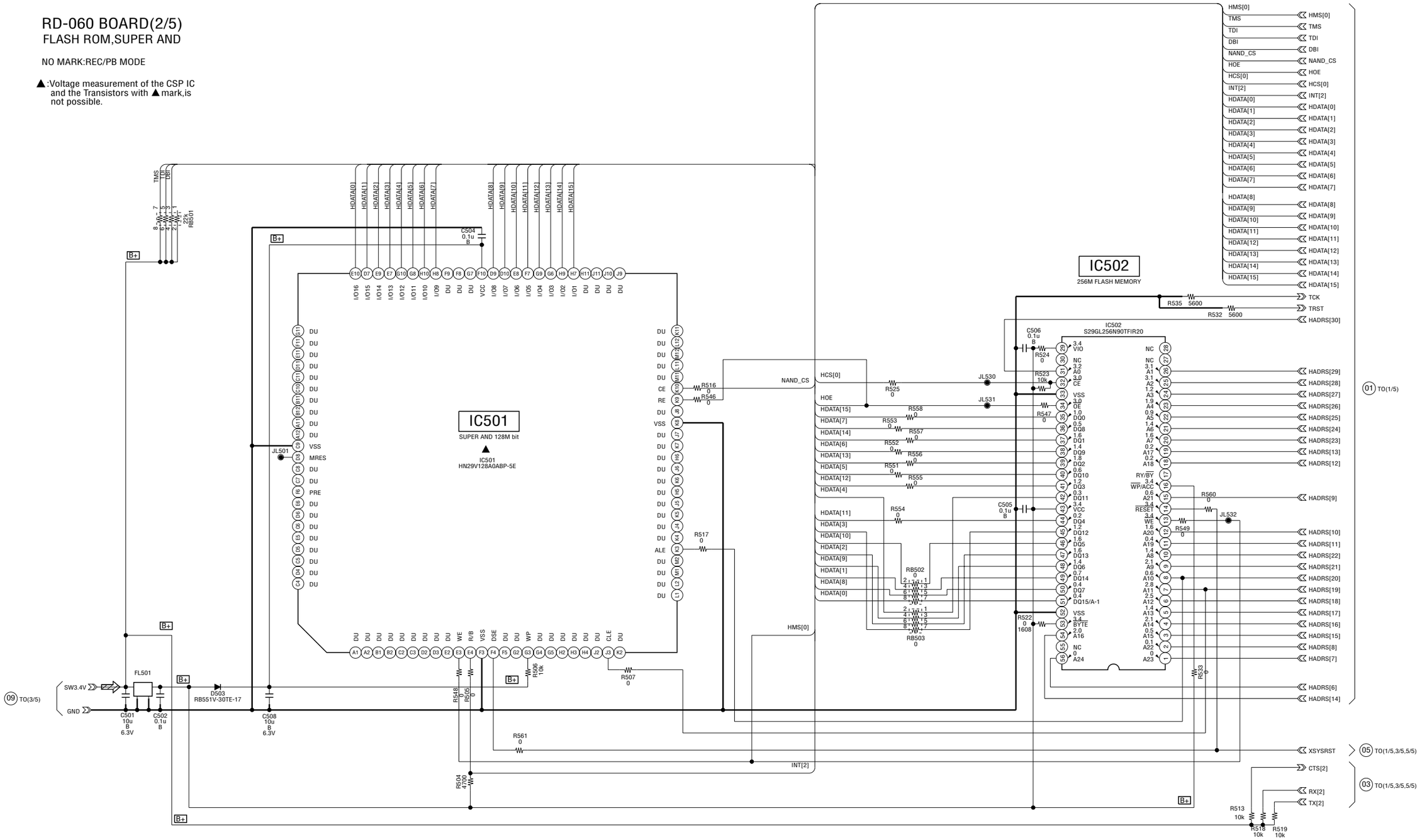
For Schematic Diagram

• Refer to page 4-33 for printed wiring board.

RD-060 BOARD(2/5)
FLASH ROM,SUPER AND

NO MARK:REC/PB MODE

▲:Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.



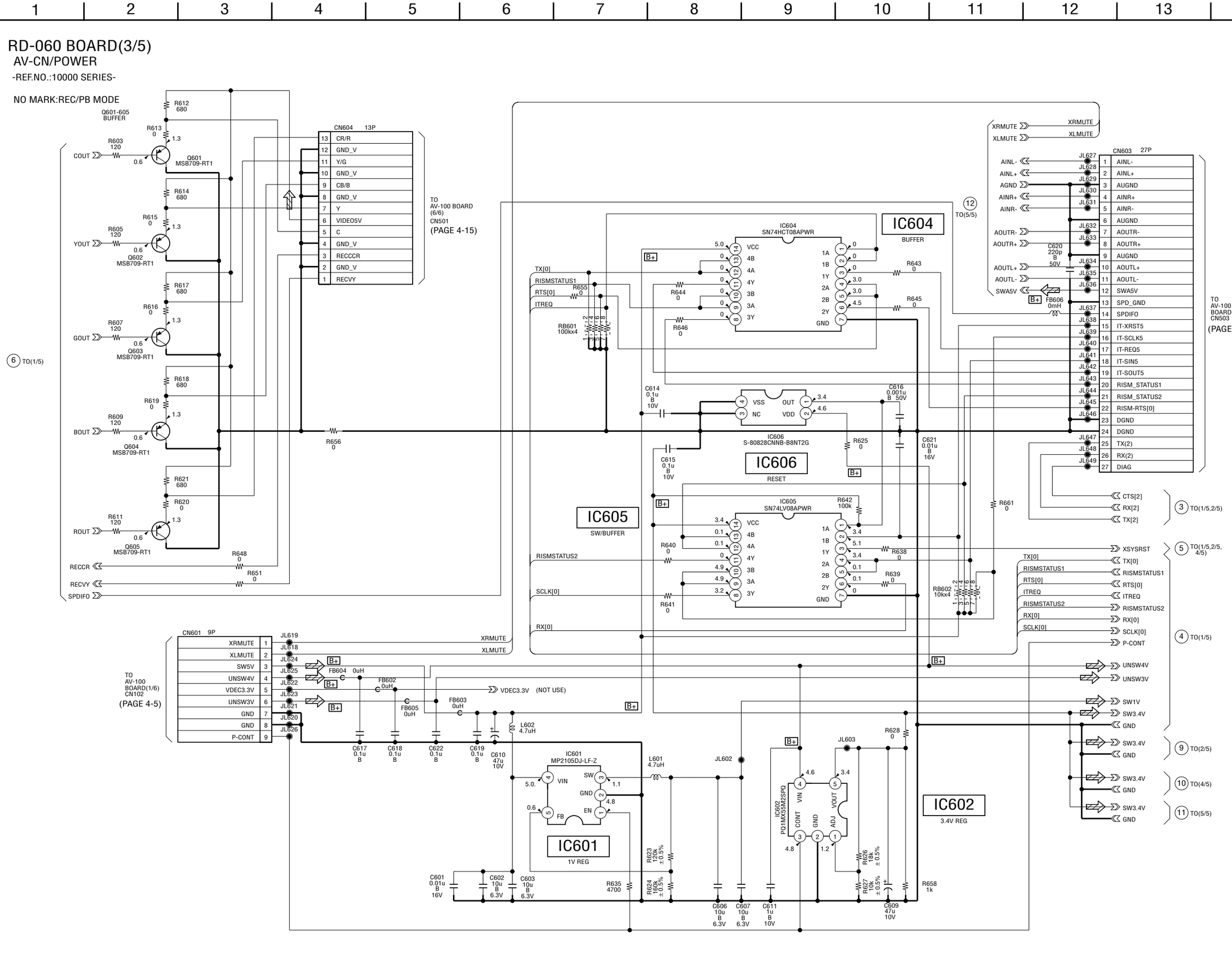
For Schematic Diagram
• Refer to page 4-33 for printed wiring board.

RD-060 BOARD(3/5)

AV-CN/POWER

-REF.NO.:10000 SERIES-

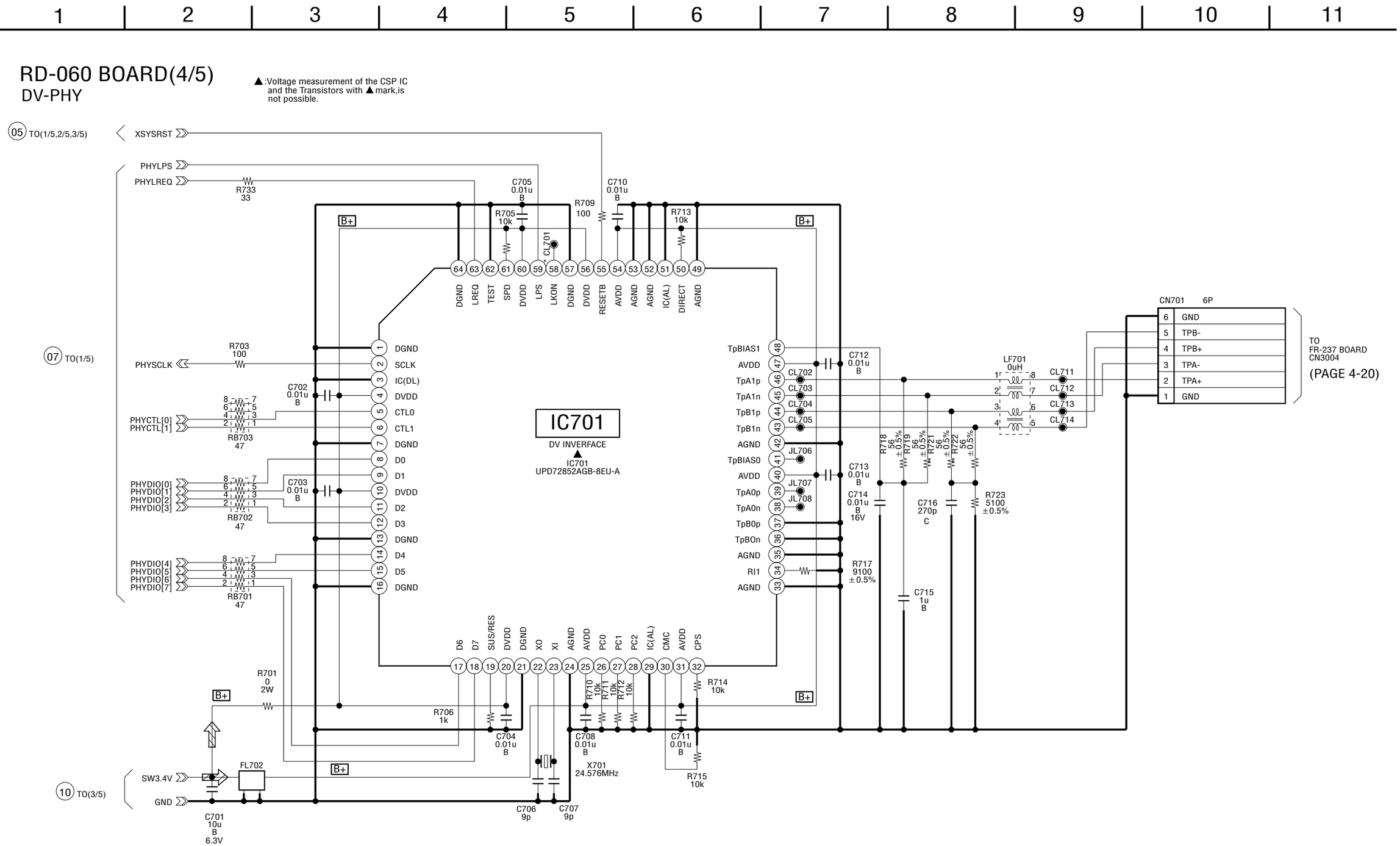
NO MARK:REC/PB MODE



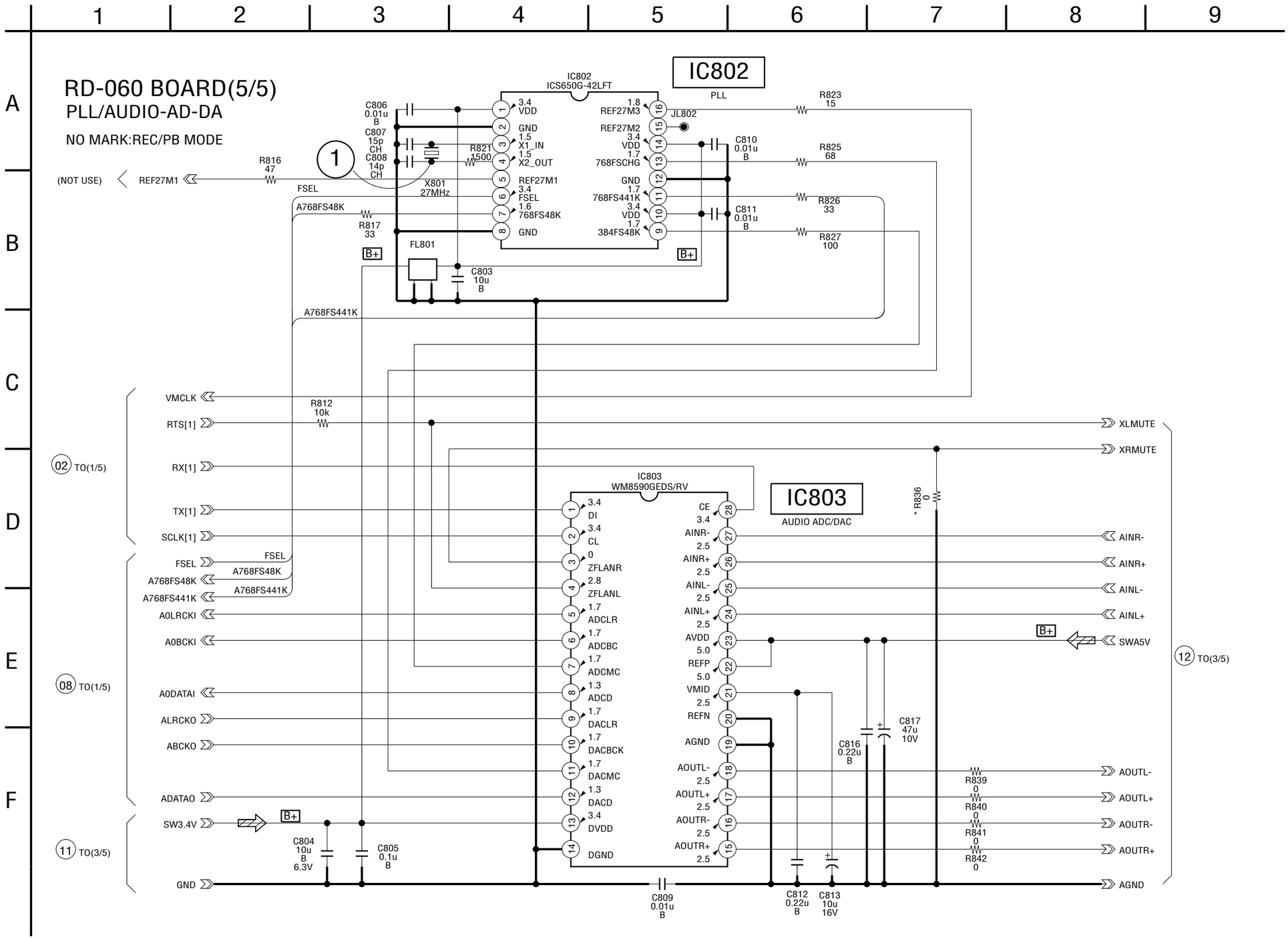
For Schematic Diagram
• Refer to page 4-33 for printed wiring board.

RD-060 BOARD(4/5)
DV-PHY

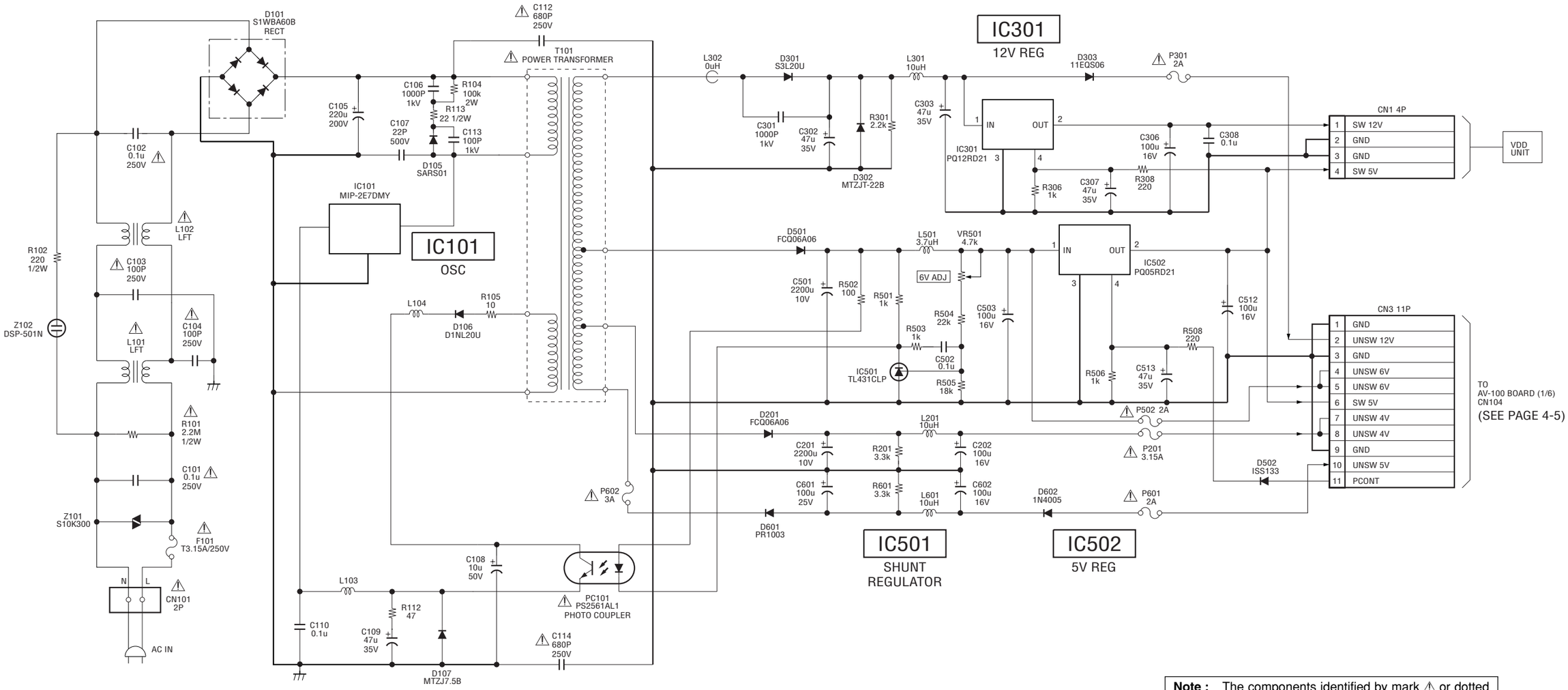
▲:Voltage measurement of the CSP IC and the Transistors with ▲mark,is not possible.



For Schematic Diagram
• Refer to page 4-33 for printed wiring board.
• Refer to page 4-4 for waveforms.



⚠ SWITCHING REGULATOR (SRV-1854UC)

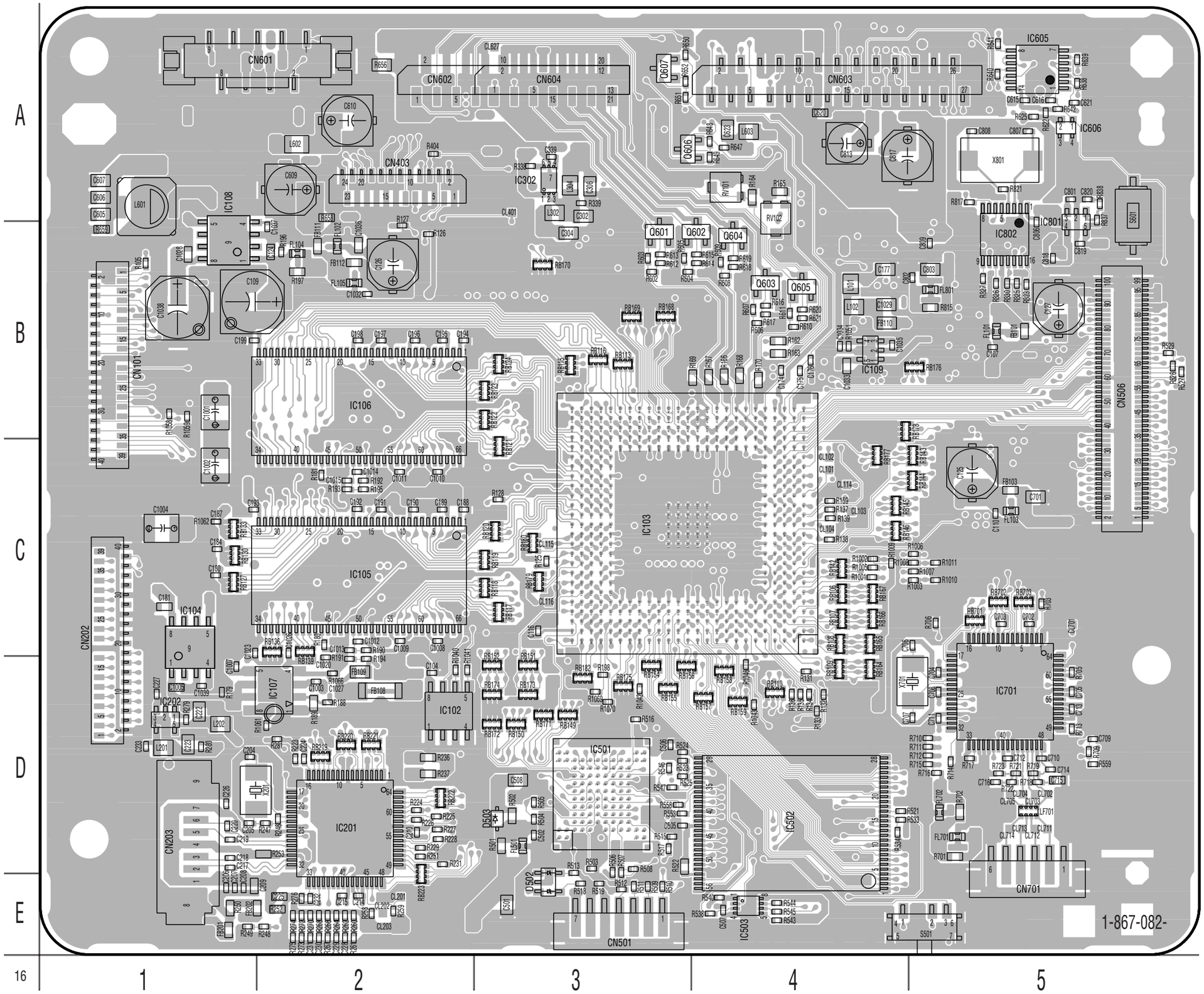


Note :	The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.
Note :	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

4-3. PRINTED WIRING BOARDS

RD-060 BOARD (SIDE A)

• : Uses unleaded solder.



34

RD-060 BOARD (SIDE A)

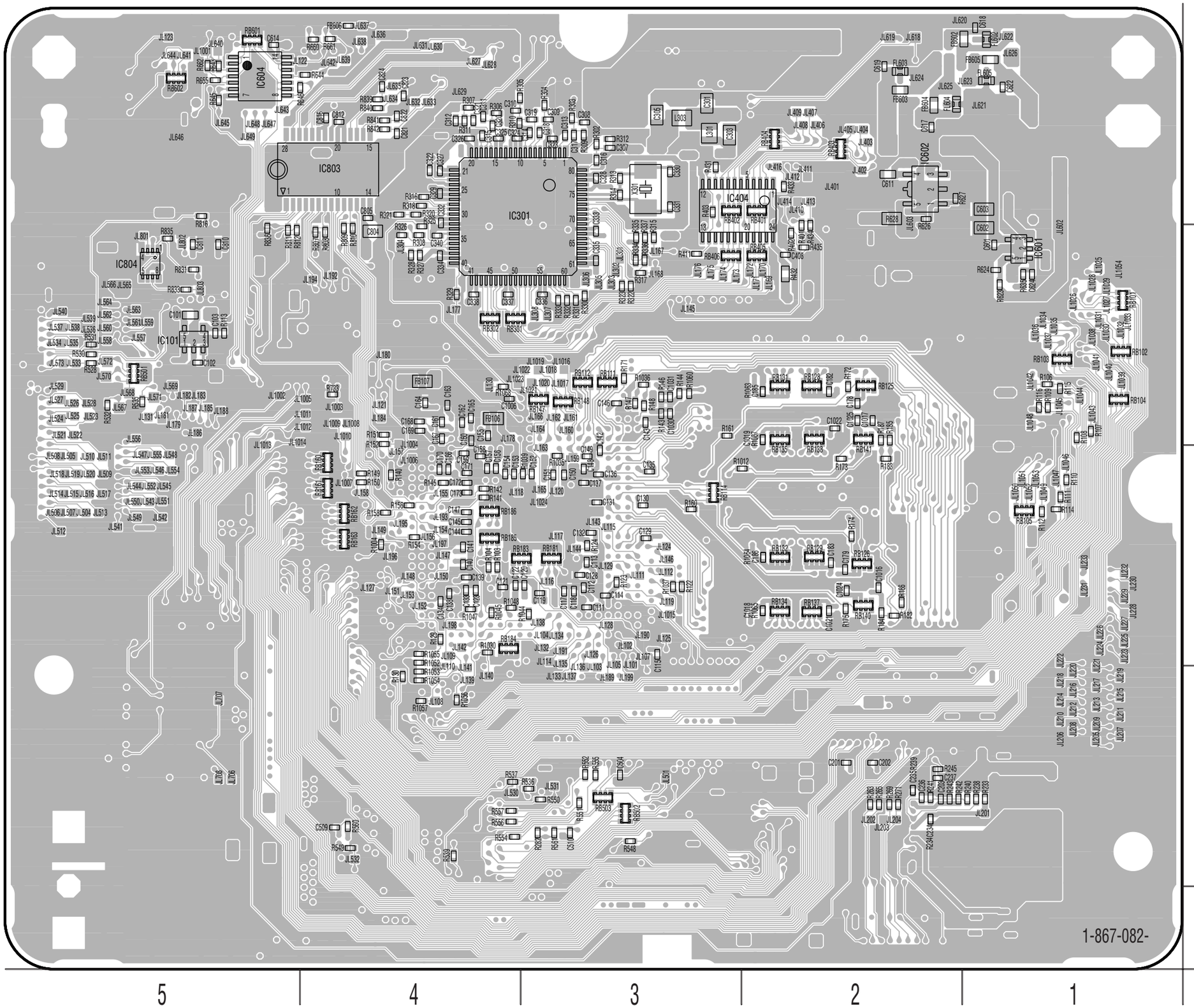
CN101	B-1
CN601	A-1
CN603	A-4
CN604	A-3
CN701	E-5
D503	D-3
IC103	C-3
IC105	C-2
IC106	B-2
IC108	A-1
IC109	B-4
IC501	D-3
IC502	D-4
IC605	A-5
IC606	A-5
IC701	D-5
IC802	B-5
Q601	B-3
Q602	B-4
Q603	B-4
Q604	B-4
Q605	B-4
Q606	A-3

RD-060 BOARD (SIDE B)

• : Uses unleaded solder.

RD-060 BOARD (SIDE B)

IC101 B-5
IC601 B-1
IC602 A-2
IC604 A-5
IC803 A-4



SECTION 5
IC PIN FUNCTION DESCRIPTION

5-1. IT CONTROL IC (IC603: M306H5FGFP-302UO (AV-100 BOARD))

Pin No.	Pin Name	I/O	Function
1	ONDO	I	Detection of board temperature
2	SIRCSIN	I	Input of remote control signal
3	AVLINK-IN	I	Fixed at “L”
4	FLD_DATA	O	Output of FLD data signal
5	FLD_IN	I	Fixed at “L”
6	FLD_CLK	O	Output of FLD clock signal
7	BYTE	I	Fixed at “L”
8	CNVSS	I	Connected to GND when the flash is overwritten is VCC
9	XCIN	I	Input of sub-clock signal (32.768KHz)
10	XCOUT	O	Not used
11	_RESET	I	Input of system reset signal input
12	XOUT	O	Output of main-clock signal (10MHz)
13	VSS	—	Digital GND
14	XIN	I	Input of main-clock signal (10MHz)
15	VCC1	—	Power supply input (Analog 5V)
16	_NMI	I	Fixed at “H”
17	INT_RTC	I	Input of RTC INT signal from RTC
18	_IT_REQ	I	Input of communication request signal with system controller
19	SLICE	I	Input of slicer operation detection
20	IT_XRST	O	Output communication reset signal with RISM 3
21	DIMMER	O	Output of LED power supply switch
22	JUST_CLK_2	O	Not used
23	RISM_STATUS2	O	Output of communication status 2 signal with system controller
24	P75	O	Not used
25	P74	O	Not used
26	P73	O	Not used
27	AVLINK-OUT	O	Not used
28	TU_SCL_1	O	Output of IIC clock signal
29	TU_SDA_1	O	Input/output IIC data signal
30	VSS2	—	Analog GND
31	LP2	O	Output of filter signal 2 (for Fsc)
32	LP3	O	Output of filter signal 3 (forVPS)
33	LP4	O	Output of filter signal 4 (for PDC)
34	VDD2	—	Power supply input (Analog 5V)
35	TEST1	—	Fixed at “L”
36	M1	—	Fixed at “L”
37	SLICEON	O	Output of slicer operation detection (to ⑲ pin)
38	IT_SOUT	O	Output of serial TXD 1 signal with system controller
39	IT_SIN	I	Input of serial RXD 1 signal with system controller
40	IT_SCLK	O	Output of serial CLK 1 signal with system controller
41	MONITOR	I	Input of RTS signal with system controller
42	TU_SDA_2	O	Not used
43	TU_SCL_2	O	Not used
44	RISM_STATUS3	O	Not used
45	RISM_STATUS1	I	Input of communication status 1 signal with system controller
46	CLKOUT	O	Analog GND
47	PCONT	O	Output of switch system power control signal
48	FAN_DET	I	Input of fan stopping detect signal
49	FAN_ONOFF	O	Output of fan on/off signal (“H”:fan on)
50	FAN_SPEED	O	Output of fan direction speed switching signal (“H”:high speed)
51	P_FAIL	I	Input of UNSW6V power off detection signal
52	HDET_1	I	Detection of output video signal

Pin No.	Pin Name	I/O	Function
53	CE	I	Fixed at “L”
54	HDET_2	O	Not used
55	INSEL_PCONT1	O	Output of IC’s power supply signal (“H”:INSEL)
56	XP_AMUTE	O	Output of muting signal for audio
57	SLICE_V_SW	O	Not used
58	SYNCHRO_DET	—	Detection of selection signal from component video signal
59	AREA0	I	Fixed at “H”
60	AREA1	I	Fixed at “L”
61	XP_VMUTE	O	Output of muting signal for video
62	INSEL_3	O	Not used
63	INSEL1	O	Not used
64	INSEL2	O	Not used
65	INSEL6	O	Not used
66	EEP_SDA	O	Output of IIC data signal with EEPROM
67	EEP_SCL	O	Output of IIC clock signal with EEPROM
68	XEEP_WP	O	Output of IIC writing protect signal
69	VCC2	—	Power supply input (Digital 5V)
70	INSEL4	O	Not used
71	VSS	—	Digital GND
72	INSEL5	O	Not used
73	BS_BIT_SW	O	Not used
74	BS_BST_CONT	O	Not used
75	BS_COR_DET	O	Not used
76	BS_CONV_CONT	O	Not used
77	BS_DEC_SW	O	Not used
78	BS_PCONT	O	Not used
79	BS_VOL_DET	O	Not used
80	SYNC_V_1	I	Input of vertical synchronous signal
81	SYNC_V_2	I	Fixed at “L”
82	NC	I	Not used
83	TU_PCONT_1	O	Output of tuner power supply control signal (“H”:Power on)
84	AUTO_PRESET_1	O	Output of RF gain control signal
85	TU_PCONT2	O	Not used
86	VA_PCONT	O	Output of power control signal for audio/video
87	AREA4	I	Fixed at “L”
88	AREA5	I	Fixed at “L”
89	AREA6	I	Fixed at “L”
90	FL_PCONT	O	Output of FLD grid power on signal
91	FR_PCONT	O	Not used
92	S2SW	I	Detection of line 2 S-video signal
93	FLD_XRESET	O	Not used
94	LED_STB	O	Not used
95	FLD_CS	O	Output of FLD driver strove signal
96	KEY0	I	Input of switching signal 0
97	KEY1	I	Input of switching signal 1
98	KEY2	I	Input of switching signal 2
99	KEY3	I	Input of switching signal 3
100	AN3	I	Fixed at “H”
101	TU_AFT_2	I	Fixed at “L”
102	TU_G_MAX_2	I	Fixed at “L”
103	AVSS	—	Analog GND
104	TU_G_MAX_1	I	Input of tuner gain signal
105	VREF	I	Power supply input (Analog 5V)

Pin No.	Pin Name	I/O	Function
106	AVCC	—	Power supply input (Analog 5V)
107	TEST3_CONT	O	Not used
108	START	I	Fixed at “H”
109	SYNCIN	I	Input composite video signal
110	SVREF	I	When slice the vertical synchronous signal input slice power
111	TEST2	I	Fixed at GND
112	VDD3	—	Power supply input (Analog 5V)
113	CVIN1	I	Input of component video signal
114	VSS3	—	Analog GND
115	TEST3	I	Fixed at “L”
116	TU_AFT1	I	Input of tuner ATF control signal

5-2. MAIN CONTROL IC (IC103: R8A34012BG (RD-060 BOARD))

Pin No.	Pin Name	I/O	Function
A1	AT1DATA[11]	—	Input/output of data 11
A2	AT1DATA[12]	—	Input/output of data 12
A3	AT1DATA[14]	—	Input/output of data 14
A4	AT1DIOW	O	Output of write signal
A5	AT1INTRQ	I	Input of IRQ
A6	HDREQ[0]	—	Fixed at “L”
A7	HWS[0]	O	Output of write strove signal 0
A8	HCS[1]	—	Fixed at “H”
A9	HCS[4]	—	Fixed at “H”
A10	HADRS[30]	O	Output of address 30
A11	HADRS[26]	O	Output of address 26
A12	HADRS[22]	O	Output of address 22
A13	HADRS[21]	O	Output of address 21
A14	HADRS[17]	O	Output of address 17
A15	HADRS[13]	O	Output of address 13
A16	HADRS[10]	O	Output of address 10
A17	HADRS[7]	O	Output of address 7
A18	MSDATA[0]	—	Fixed at “L”
A19	MSDATA[3]	—	Fixed at “L”
A20	SCLK[3]	—	Fixed at “H”
A21	CTS[1]	—	Fixed at “H”
A22	TX[2]	—	UART(CSIO)/GPIO
A23	RTS[1]	—	UART(CSIO)/GPIO
A24	RTS[0]	—	UART(CSIO)/GPIO
A25	DVDD		Power supply input (Digital 1.0V)
AA1	TRDATA[1]	O	Not used
AA2	TRDATA[3]	O	Not used
AA3	TRSYNC	O	Not used
AA4	EVENT[0]	O	Not used
AA5	VDD33	—	Power supply input (Digital 3.4V)
AA6	VRMA	—	Fixed at “L”
AA7	VRMB	—	Fixed at “L”
AA8	VSSDAD10		Analog GND
AA9	RREF1(REXT1)	—	Fixed at “L”
AA10	REF2(REXT2)	—	Fixed at “L”
AA11	VDD33	—	Power supply input (Digital 3.4V)
AA12	VDD	—	Power supply input (Digital 1.0V)
AA13	VSS		Digital GND
AA14	VDD	—	Power supply input (Digital 1.0V)
AA15	VSS		Digital GND
AA16	VDD33	—	Power supply input (Digital 3.4V)
AA17	VDD	—	Power supply input (Digital 1.0V)
AA18	DADRS[3]	O	Output of address 3
AA19	DADRS[10]	O	Output of address 10
AA20	VDD	—	Power supply input (Digital 1.0V)
AA21	DDATA[8]	—	Input/output of data 8
AA22	VDD25	—	Power supply input (Digital 2.5V)
AA23	DDATA[10]	—	Input/output of data 10
AA24	DDATA[3]	—	Input/output of data 3
AA25	DDATA[4]	—	Input/output of data 4
AB1	TRDATA[4]	O	Not used
AB2	TRDATA[7]	O	Not used
AB3	TRST	I	Not used

Pin No.	Pin Name	I/O	Function
AB4	VCCAAD10A	—	Power supply input (Analog 3.3V)(ADC)
AB5	VROA	—	Fixed at “L”
AB6	VROB	—	Fixed at “L”
AB7	VCCAAD10B	—	Power supply input (Analog 3.3V)(ADC)
AB8	VCCADA10	—	Power supply input (Analog 3.3V)(DAC)
AB9	VCCADA10	—	Power supply input (Analog 3.3V)(DAC)
AB10	VCCADA10	—	Power supply input (Analog 3.3V)(DAC)
AB11	VSS		Digital GND
AB12	TESTMOD[5]	O	Fixed at “L”
AB13	REC656V	I	Not used
AB14	REC656O[1]	O	Not used
AB15	REC656O[3]	O	Not used
AB16	PXCLK	O	Not used
AB17	REC656O[7]	O	Not used
AB18	DADRS[5]	O	Output of address 5
AB19	VDD25	—	Power supply input (Digital 2.5V)(I/O)
AB20	DADRS[7]	O	Output of address 7
AB21	DADRS[9]	O	Output of address 9
AB22	DADRS[12]	O	Output of address 12
AB23	VSS		Digital GND
AB24	DDATA[1]	—	Input/output of data 1
AB25	DDATA[2]	—	Input/output of data 2
AC1	TRDATA[5]	O	Not used
AC2	TCK	I	Not used
AC3	TDO	O	Not used
AC4	VRPA	—	Fixed at “L”
AC5	VRPB	—	Fixed at “L”
AC6	VSSAAD10B		Analog GND
AC7	VCCDAD10		Power supply input (Digital 3.3V)(ADC)
AC8	VSSDDA10A	—	Digital GND
AC9	VDDDDA10	—	Power supply input (Digital 1.0V)
AC10	VSSDDA10B	—	Fixed at “L”
AC11	TESTMOD[1]	O	Fixed at “L”
AC12	TESTMOD[6]	O	Fixed at “L”
AC13	REC656H	I	Not used
AC14	REC656I[1]	I	Not used
AC15	REC656O[2]	O	Not used
AC16	REC656O[4]	O	Not used
AC17	REC656I[7]	I	Not used
AC18	DADRS[4]	O	Output of address 4
AC19	DADRS[6]	O	Output of address 6
AC21	DADRS[8]	O	Output of address 8
AC20	VSS		Digital GND
AC22	DADRS[11]	O	Output of address 11
AC23	DWE	O	Output of write enable signal
AC24	VDD25	—	Power supply input (Digital 2.5V)
AC25	DDATA[0]	—	Input/output of data 0
AD1	EVENT[1]	O	Not used
AD2	VINA1	I	Input of analog video (CVBS)
AD3	VSSAAD10A		Analog GND
AD4	NC		Not used
AD5	VCCAAD10B	—	Power supply input (Analog 3.3V)(DAC)
AD6	ROUT(PD0)	O	Output of analog video signal (red)

Pin No.	Pin Name	I/O	Function
AD7	VSSADA10	—	Analog GND
AD8	BOUT(PD2)	O	Output of analog video signal (blue)
AD9	VSSADA10	—	Analog GND
AD10	COUT(PD3)	O	Output of analog video signal (chroma)
AD11	TESTMOD[2]	O	Fixed at “L”
AD12	TESTMOD[7]	O	Fixed at “L”
AD13	TMS	I	SDI-ICE/JTAG TMS
AD14	REC656O[0]	O	Not used
AD15	REC656I[2]	I	Not used
AD16	REC656I[4]	I	Not used
AD17	REC656O[5]	O	Not used
AD18	REC656O[6]	O	Not used
AD19	DADRS[1]	O	Output of address 1
AD20	DBA[1]		Output of bank address 1
AD21	VDD25	—	Power supply input (Analog 2.5V)
AD22	DCS	O	Output of chip select signal
AD23	DCAS	O	Output of CAS
AD24	DCLKO	O	Output of clock signal
AD25	VSS		Digital GND
AE1	TD1	I	Not used
AE2	VSSAAD10A		Analog GND
AE3	VINA2	I	Input of analog video signal (Y)
AE4	VCCAAD10A	—	Power supply input (Analog 3.3V)(DAC)
AE5	VINB1	—	Input of analog video signal (C)
AE6	VSSAAD10B		Analog GND
AE7	GOUT(PD1)	O	Output of analog video signal (G)
AE8	VSSADA10	—	Analog GND (DAC)
AE9	YOUT(PD4)	O	Output of analog video signal (Y)
AE10	TESTMOD[0]	O	Fixed at “L”
AE11	TESTMOD[3]	O	Fixed at “L”
AE12	TESTMOD[4]	O	Fixed at “L”
AE13	RESET	I	Input of hardware reset signal
AE14	REC656I[0]	I	Not used
AE15	R656CLKI	I	Not used
AE16	REC656I[3]	I	Not used
AE17	REC656I[5]	I	Not used
AE18	REC656I[6]	I	Not used
AE19	DADRS[2]	O	Output of address 2
AE20	DADRS[0]	O	Output of address 0
AE21	DBA[0]	O	Output of bank address 0
AE22	VSS		Digital GND
AE23	DRAS	O	Output of RAS
AE24	DCLKNO	O	Output of negative clock signal
AE25	DVREF	I	Input of reference voltage
B1	AT1DATA[4]	—	Input/output of data 11
B2	AT1DATA[3]	—	Input/output of data 11
B3	AT1DATA[1]	—	Input/output of data 1
B4	AT1DMAREQ	I	Input of request signal from DMA
B5	AT1DMACK	O	Input of ACK signal from DMA
B6	AT1ADR[2]	O	Output of devise address 2
B7	HDACK[1]	—	Not used
B8	HOE	O	Output of output enable signal
B9	HCS[2]	—	Output of chip select signal/GPIO 2

Pin No.	Pin Name	I/O	Function
B10	HADRS[31]	O	Output of address 30
B11	HADRS[27]	O	Output of address 30
B12	HADRS[23]	O	Output of address 30
B13	HADRS[20]	O	Output of address 30
B14	HADRS[16]	O	Output of address 30
B15	HADRS[12]	O	Output of address 30
B16	HADRS[8]	O	Output of address 30
B17	MSBS	—	Fixed at “L”
B18	MSDATA[2]	—	Fixed at “L”
B19	MSCLK	—	Fixed at “L”
B20	SCLK[0]	—	UART(CSIO)/GPIO
B21	TX[1]	—	UART(CSIO)/GPIO
B22	RTS[2]	—	Fixed at “H”
B23	DVSS		Digital GND
B24	PCO	O	Not used
B25	AHVDD		Power supply input (Analog 3.3V)
C1	AT1DATA[5]	—	Input/output of data 5
C2	AT1DATA[10]	—	Input/output of data 10
C3	AT1DATA[13]	—	Input/output of data 13
C4	AT1DATA[15]	—	Input/output of data 11
C5	AT1IORDY	I	Input of i/o ready
C6	AT1ADR[0]	O	Output of devise address 0
C7	AT1CS[0]	O	Output of chip select signal 0
C8	HDACK[0]	—	Output of transfer acknowledge signal/GPIO 0
C9	HCS[0]	O	Output of chip select signal 0
C10	HCS[5]	—	Output of chip select signal/GPIO 5
C11	HADRS[28]	O	Output of address 30
C12	HADRS[24]	O	Output of address 30
C13	HADRS[19]	O	Output of address 30
C14	HADRS[15]	O	Output of address 30
C15	HADRS[11]	O	Output of address 30
C16	HADRS[6]	O	Output of address 30
C17	MSDATA[1]	—	Fixed at “L”
C18	CTS[3]	—	Not used
C19	SCLK[1]	—	UART(CSIO)/GPIO
C20	CTS[0]	—	UART(CSIO)/GPIO
C21	RTS[3]	—	Fixed at “H”
C22	RX[2]	—	UART(CSIO)/GPIO
C23	AHVSS		Digital GND
C24	RX[1]	—	UART(CSIO)/GPIO
C25	HDATA[15]	—	Input/output of data 15
D1	AT1DATA[6]	—	Input/output of data 6
D2	AT1DATA[9]	—	Input/output of data 9
D3	AT1DATA[2]	—	Input/output of data 11
D4	AT1DATA[0]	—	Input/output of data 11
D5	AT1DIOR	O	Output of I/O read signal
D6	AT1ADR[1]	O	Output of devise address 1
D7	AT1CS[1]	O	Output of chip select signal 1
D8	HDREQ[1]	—	Not used
D9	HWS[1]	O	Fixed at “H”
D10	HCS[3]	—	Fixed at “H”
D11	HADRS[29]	O	Output of address 29
D12	HADRS[25]	O	Output of address 25

Pin No.	Pin Name	I/O	Function
D13	HADRS[18]	O	Output of address 18
D14	HADRS[14]	O	Output of address 14
D15	HADRS[9]	O	Output of address 9
D16	MSINS	—	Fixed at “L”
D17	SCLK[2]	—	Fixed at “H”
D18	CTS[2]	—	UART(CSIO)/GPIO
D19	TX[0]	—	UART(CSIO)/GPIO
D20	TX[3]	—	Fixed at “H”
D21	RX[3]	—	Fixed at “H”
D22	VMCLK	I	Input of 27MHz system clock
D23	RX[0]	—	UART(CSIO)/GPIO
D24	HDATA[13]	—	Input/output of data 11
D25	HDATA[10]	—	Input/output of data 11
E1	AT2CS[1]	O	Not used
E2	AT1RESET	O	Output of reset signal
E3	AT1DATA[7]	—	Input/output of data 11
E4	AT1DATA[8]	—	Input/output of data 11
E5	VDD	—	Power supply input (Digital 1.0V)
E6	VSS		Digital GND
E7	VDD	—	Power supply input (Digital 1.0V)
E8	VDD33	—	Power supply input (Digital 3.3V)
E9	VSS		Digital GND
E10	VDD	—	Power supply input (Digital 1.0V)
E11	VSS		Digital GND
E12	VDD33	—	Power supply input (Digital 3.3V)
E13	VDD	—	Power supply input (Digital 1.0V)
E14	VSS		Digital GND
E15	VDD	—	Power supply input (Digital 1.0V)
E16	VSS		Digital GND
E17	VDD33	—	Power supply input (Digital 3.3V)
E18	VDD	—	Power supply input (Digital 1.0V)
E19	VSS		Digital GND
E20	VDD	—	Power supply input (Digital 1.0V)
E21	VDD33	—	Power supply input (Digital 3.3V)
E22	HDATA[4]	—	Input/output of data 4
E22	HDATA[14]	—	Input/output of data 14
E23	HDATA[12]	—	Input/output of data 12
E24	HDATA[9]	—	Input/output of data 9
E25	HDATA[8]	—	Input/output of data 8
F1	AT2ADR[1]	O	Not used
F2	AT2ADR[0]	O	Not used
F3	AT2ADR[2]	O	Not used
F4	AT2CS[0]	O	Not used
F5	VSS		Digital GND
F21	VDD	—	Power supply input (Digital 1.0V)
F22	HDATA[11]	—	Input/output of data 11
F23	TEST	—	Fixed at GND
F24	HDATA[7]	—	Input/output of data 7
F25	HDATA[5]	—	Input/output of data 5
G1	AT2DIOR	O	Not used
G2	AT2IORDY	I	Not used
G3	AT2DMACK	O	Not used
G4	AT2INTRQ	I	Not used

Pin No.	Pin Name	I/O	Function
G5	VDD33	—	Power supply input (Digital 3.3V)
G21	VSS		Digital GND
G22	CSYNC	—	Fixed at “H”
G23	HDATA[6]	—	Input/output of data 6
G24	HDATA[3]	—	Input/output of data 3
G25	HDATA[2]	—	Input/output of data 2
H1	AT2DATA[0]	—	Fixed at “L”
H2	AT2DATA[15]	—	Fixed at “L”
H3	AT2DMAREQ	I	Not used
H4	AT2DIOW	O	Not used
H5	VDD	—	Power supply input (Digital 1.0V)
H21	VDD	—	Power supply input (Digital 1.0V)
H22	HDATA[4]	—	Input/output of data 4
H23	HDATA[1]	—	Input/output of data 1
H24	HDATA[0]	—	Input/output of data 0
H25	INT[7]	—	Interrupt request/GPIO
J1	AT2DATA[2]	—	Fixed at “L”
J2	AT2DATA[13]	—	Fixed at “L”
J3	AT2DATA[1]	—	Fixed at “L”
J4	AT2DATA[14]	—	Fixed at “L”
J5	VSS		Digital GND
J21	VDD33	—	Power supply input (Digital 3.3V)
J22	INT[8]	—	Not used
J23	DBI	I	SDI-ICE/JTAG TRST
J24	INT[6]	—	Fixed at “H”
J25	INT[5]	—	Fixed at “H”
K1	AT2DATA[4]	—	Fixed at “L”
K2	AT2DATA[11]	—	Fixed at “L”
K3	AT2DATA[3]	—	Fixed at “L”
K4	AT2DATA[12]	—	Fixed at “L”
K5	VDD	—	Power supply input (Digital 1.0V)
K21	VSS		Digital GND
K22	INT4		Fixed at “H”
K23	WP(INT3)		Fixed at “H”
K24	SDA[1]	—	Fixed at “H”
K25	SDA[0]	—	Fixed at “H”
L1	AT2DATA[6]	—	Fixed at “L”
L2	AT2DATA[9]	—	Fixed at “L”
L3	AT2DATA[5]	—	Fixed at “L”
L4	AT2DATA[10]	—	Fixed at “L”
L5	VDD33	—	Power supply input (Digital 3.3V)
L11	VSS		Digital GND
L12	VSS		Digital GND
L13	VSS		Digital GND
L14	VSS		Digital GND
L15	VSS		Digital GND
L21	SDCL[0]	—	Fixed at “H”
L22	SDCL[1]	—	Fixed at “H”
L23	INT[2]	—	Interrupt request/GPIO
L24	INT[1]	—	Fixed at “H”
L25	INT[0]	—	Fixed at “H”
M1	AT2RESET	O	Not used
M2	A1BCKI	I	Fixed at “H”

Pin No.	Pin Name	I/O	Function
M3	AT2DATA[7]	—	Fixed at “L”
M4	AT2DATA[8]	—	Fixed at “L”
M5	VSS		Digital GND
M11	VSS		Digital GND
M12	VSS		Digital GND
M13	VSS		Digital GND
M14	VSS		Digital GND
M15	VSS		Digital GND
M21	VDD	—	Power supply input (Digital 1.0V)
M22	DDATA[30]	—	Input/output of data 11
M23	DDATA[31]	—	Input/output of data 11
M24	VDD25	—	Power supply input (Digital 2.5V)
M25	HWAIT	—	Fixed at “H”
N	VDD	—	Power supply input (Digital 1.0V)
N1	A1DDATAI	I	Fixed at “H”
N2	AMCLK1	I	Input of audio master clock (36.864MHz)
N3	A1LRCKI	I	Fixed at “H”
N4	ADATAO	O	Output of audio signal
N5	VDD	—	Power supply input (Digital 1.0V)
N11	VSS		Digital GND
N12	VSS		Digital GND
N13	VSS		Digital GND
N14	VSS		Digital GND
N15	VSS		Digital GND
N21	DDATA[21]	—	Input/output of data 11
N22	DDATA[28]	—	Input/output of data 11
N23	DDATA[29]	—	Input/output of data 11
N24	DDATA[22]	—	Input/output of data 11
N25	DDATA[23]	—	Input/output of data 11
P1	ADCCLKI	O	Not used
P2	LRCKO	O	Output of audio L/R clock signal
P3	A0DATAI	I	Output of audio signal
P4	A0BCKI	I	Input of audio bit clock signal
P5	VDD	—	Power supply input (Digital 3.3V)
P11	VSS		Digital GND
P12	VSS		Digital GND
P13	VSS		Digital GND
P14	VSS		Digital GND
P15	VSS		Digital GND
P21	DDATA[18]	—	Input/output of data 11
P22	DDATA[26]	—	Input/output of data 11
P23	DDATA[27]	—	Input/output of data 11
P24	DDATA[19]	—	Input/output of data 11
P25	DDATA[20]	—	Input/output of data 11
R1	SPDIFO	O	Input of digital audio signal
R2	VCLKI	I	Input of clock signal (27MHz) (Video decoder)
R3	BCKO	O	Output of audio bit clock signal
R4	AMCLK2	I	Input of audio master clock (33.8688MHz)
R5	VDD	—	Power supply input (Digital 1.0V)
R11	VSS		Digital GND
R12	VSS		Digital GND
R13	VSS		Digital GND
R14	VSS		Digital GND

Pin No.	Pin Name	I/O	Function
R15	VSS		Digital GND
R21	DDATA[25]	—	Input/output of data 25
R22	VDD25	—	Power supply input (Digital 2.5V)
R23	VSS		Digital GND
R24	DDATA[16]	—	Input/output of data 16
R25	DDATA[17]	—	Input/output of data 17
T1	A0LRCKI	I	Input of audio L/R clock signal
T2	DACCLKO	O	Not used
T3	SPDIFI	I	Fixed at “H”
T4	PHYDIO[7]	—	Not used
T5	VSS		Digital GND
T21	DDM[2]	O	Output of data mask signal 2
T22	DDQS[3]	I	Output of data strobe signal 3
T23	DDATA[24]	I/O	Input/output of data 24
T24	VDD25	—	Power supply input (Digital 2.5V)
T25	VSS		Digital GND
U1	PHYLREQ	O	Not used
U2	PHYDIO[6]	—	Not used
U3	PHYDIO[4]	—	Not used
U4	PHYDIO[1]	—	Not used
U5	VDD	—	Power supply input (Digital 1.0V)
U21	DDM[1]	O	Output of data mask signal 1
U22	DDQS[1]	—	Output of data strobe signal 1
U23	DDM[3]	O	Output of data mask signal 3
U24	DDM[0]	O	Output of data mask signal 0
U25	DDQS[2]	—	Output of data strobe signal 2
V1	PHYDIO[5]	—	Not used
V2	PHYDIO[3]	—	Not used
V3	PHYDIO[0]	—	Not used
V4	PHYCTL[1]	—	Not used
V5	VDD33	—	Power supply input (Analog 3.3V)(DAC)
V21	VDD	—	Power supply input (Digital 1.0V)
V22	VDD25	—	Power supply input (Digital 2.5V)
V23	DDATA[15]	—	Input/output of data 15
V24	DDATA[7]	—	Input/output of data 7
V25	DDQS[0]	—	Output of data strobe signal 0
W1	PHYDIO[2]	—	Not used
W2	PHYLPS	O	Not used
W3	PHYSCLK	I	Not used
W4	TRDATA[2]	O	Not used
W5	VSS		Digital GND
W21	DDATA[14]	—	Input/output of data 14
W22	DDATA[13]	—	Input/output of data 13
W23	VSS		Digital GND
W24	VDD25	—	Power supply input (Digital 2.5V)
W25	DDATA[6]	—	Input/output data 6
Y1	PHYCTL[0]	—	Not used
Y2	TRDATA[0]	O	Not used
Y3	TRCLK	O	Not used
Y4	TRDATA[6]	O	Not used
Y5	VDD	—	Power supply input (Digital 1.0V)
Y21	DDATA[9]	—	Input/output of data 9
Y22	DDATA[11]	—	Input/output of data 11

Pin No.	Pin Name	I/O	Function
Y23	DDATA[12]	—	Input/output of data 12
Y24	DDATA[5]	—	Input/output of data 5
Y25	VSS		Digital GND

SECTION 6
SERVICE MODE

This is the diagnostics to locate cause of fault.
The diagnostics can be executed using the remote commander and a monitor.
To enter the service mode, connect the VIDEO OUT connector of the main unit to the monitor. While pressing the "⏏" (Open/Close) button and the "▷" (PLAY) button at the same time, connect the AC power cord to the power outlet. (Keep pressing the above buttons until a message, "WELCOME" appears on the display panel of the main unit.)
While the diagnostics is in progress, either "OK" or "NG" appears on the monitor screen to enable the judgment whether the respective devices or the peripheral are normal or have any abnormality.
When an abnormality is detected, the diagnostics is stopped at that moment and you can select to keep running the diagnostics or to stop it.

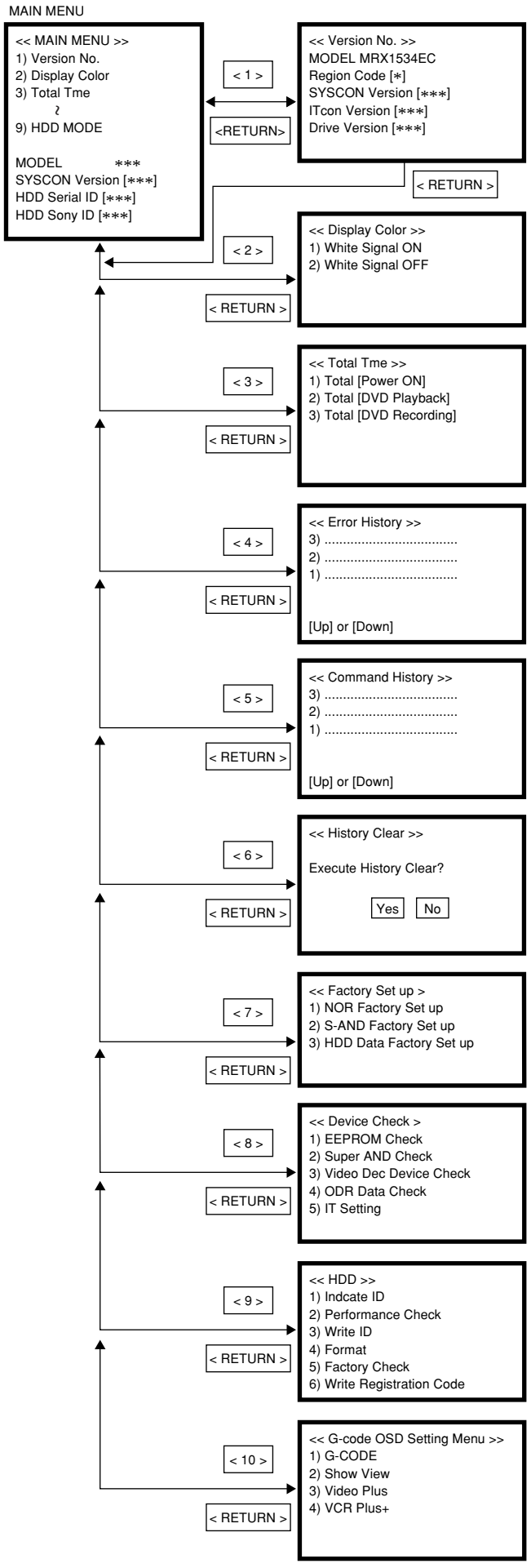
6-1. Check Item

Checking item	IC name	REF
SUPER AND	IC HN29V128A0ABP-5E	IC501
DDR	IC K4H511638C-UCB3T	IC105
DDR	IC K4H511638C-UCB3T	IC106

All parts are mounted on the RD-060 board.

When NG is displayed as the result of the DEVICE TEST, the IC or its peripheral is defective.

6-2. Screen Transition in the Service Mode



Verifying version number of the respective software of the main unit

Setting ON/OFF of the NTSC 100% white signal output

Reading the accumulative operating hours of the drive
- Total power-on hours
- Total DVD playback hours
- Total DVD recording hours

* Display format: ○○ hours △△ minutes

Displaying the error history in the past in the error code
* Maximum 20 errors can be displayed.

Displaying history of the buttons pressed in the past.
* Pressed buttons for 400 commands at a maximum can be stored.

Clearing the Error History and the Command History

Returning the Set Ups of various functions to default

Diagnostic checks in the Service Mode

Not used

6-3. Items and Description of Service Mode Menu

1) When the key “1” is pressed down, the monitor display moves to the Version No. check menu screen.
2) When the key “2” is pressed down, the monitor display moves to the Display Color check menu screen.
3) When the key “3” is pressed down, the monitor display moves to the Total Time check menu screen.
4) When the key “4”is pressed down, the monitor display moves to the Error History check menu screen.
5) When the key “5” is pressed down, the monitor display moves to the Command History check menu screen.
6) When the key “6” is pressed down, the monitor display moves to the History Clear check menu screen.
7) When the key “7” is pressed down, the monitor display moves to the Factory Set Up check menu screen.
8) When the key “8” is pressed down, the monitor display moves to the Device Check menu screen.
9) Key “9” is not used.
0) When the key “0” is pressed down, the monitor display moves to the G-code Setting menu screen.

```
<< MAIN MENU >>
1) Version No.
2) Display Color
3) Total Time
4) Error History
5) Command History
6) History Clear
7) Factory Set Up
8) Device Check
9) HDD MODE      → Not used
0) G-code Setting
MODEL      ***
SYSCON Version [***]
HDD Serial ID [***]
Sony ID [***]
```

6-4. Device Check Menu (Diagnostic Test)

1) Key “1” is not used.
2) When the key “2” is pressed down, the Super AND device check will be executed. (The Super AND device is checked whether it is mounted or not, and the I2C communication between Rism3 (IC103) and Super AND is checked.)
3) Key “3” is not used.
4) When the key “4” is pressed down, the DDR Data device check will be executed. (The DDR device is checked whether it is mounted or not, and the electrical signal connection between Rism3 (IC103) and DDR device is checked.)
5) When the key “5” is pressed down, IC603 of the AV board will be patched.
   (Never press the key “5” unless otherwise specified.)

```
<< Device check >>
1) EEPROM Check          → Not used
2) Super AND Check
3) Video Dec Device Check  → Not used
4) DDR Date Check
5) IT Setting
```

Check result display: IC105 check result/IC106 check result

Display Message	Meaning of Display
DATA OK/OK	Both IC105 and IC106 are OK.
DATA OK/NG	IC105: OK, IC106: NG (NG: No Good)
DATA NG/OK	IC105: NG, IC106: OK
DATA NG/NG	Both IC105 and IC106 are NG.

MEMO

SECTION 7
ADJUSTMENT

7-1. Video System Adjustment

Preparing for Adjustment

1. Equipments

• Oscilloscope
• Reference Disk
HLX-505 (NTSC single layer disc) J-6090-089-A
HLX-504 (NTSC dual layer disc) J-6090-088-A

1. Video Output Level Check

<Purpose>

This check is made to satisfy the NTSC signal standard, If it is adjusted incorrectly, brightness will be too bright or too dark.

Mode	PLAY
Signal	Color bars
Test point	Output (VIDEO) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V± 0.07 p-p

Check method:

1) Insert the NTSC reference disc and play back the 100% color bars.
2) Confirm that the video level is 1.0 V±0.07 Vp-p.

Fig. 7-1

2. S-Video Output S-Y Check

<Purpose>

This check confirms that the S-video Y-signal output has the rated amplitude. If it adjusted incorrectly, the playback video signal will not be displayed corrected even when the S-video cable is connected.

Mode	PLAY
Signal	Color bars
Test point	S-VIDEO OUTPUT (S-Y) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V±0.07 p-p

Check method:

1) Insert the NTSC reference disc and play back the 100% color bars.
2) Confirm that the video level is 1.0 V±0.07 Vp-p.

Fig. 7-2.

3. S-Video Output S-C Check

<Purpose>

This check confirms that the S-video output S-C conforms to the NTSC standard. If it adjusted incorrectly, the playback color will not be too dark or too thin.

Mode	PLAY
Signal	Color bars
Test point	S-VIDEO OUTPUT (S-C) connector (terminated in 75Ω)
Instrument	Oscilloscope
Specification	286 mV±30 mVp-p

Check method:

1) Insert the NTSC reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 286 mV±30 mVp-p.

Fig. 7-3.

4. Component Video Output Y Check

<Purpose>

This check confirms that the component Y signal output has the rated amplitude. If this signal level is not correct, brightness of the video signal will not be too dark or too thin when the COMPONENT connector output signal is connected to a projector having COMPONENT input.

Mode	PLAY
Signal	Color bars
Test point	COMPONENT VIDEO OUT connector pin-① (terminated in 75Ω)
Instrument	Oscilloscope
Specification	1.0 V±0.07Vp-p

Check method:

1) Insert the NTSC reference disc and play back the 100% color bars.
2) Confirm that the Y signal level is 1.0 V±0.07 Vp-p.

Fig. 7-4.

5. Component Video Output B-Y Check

<Purpose>

This check confirms that the B-Y signal of the component video conforms to the NTSC standard. If this signal level is not correct, color of the video signal will have different color when the COMPONENT connector output signal is connected to a projector having COMPONENT input.

Mode	PLAY
Signal	Color bars
Test point	COMPONENT VIDEO OUT connector pin-③ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

1) Insert the NTSC reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 700 mV±50 mVp-p.

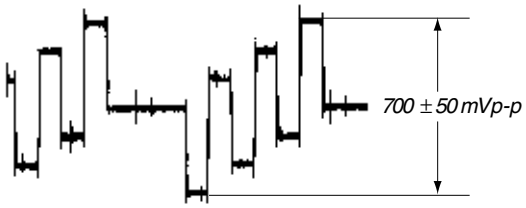


Fig. 7-5.

6. Component Video Output R-Y Check

<Purpose>

This check confirms that the R-Y signal of the component video conforms to the NTSC standard. If this signal level is not correct, color of the video signal will have different color when the COMPONENT connector output signal is connected to a projector having COMPONENT input.

Mode	PLAY
Signal	Color bars
Test point	COMPONENT VIDEO OUT connector pin-⑤ (terminated in 75Ω)
Instrument	Oscilloscope
Specification	700 mV±50 mVp-p

Check method:

1) Insert the NTSC reference disc and play back the 100% color bars.
2) Confirm that the burst signal level is 700 mV±50 mVp-p.

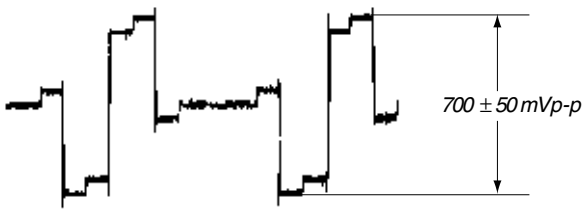


Fig. 7-6

SECTION 8
REPAIR PARTS LIST

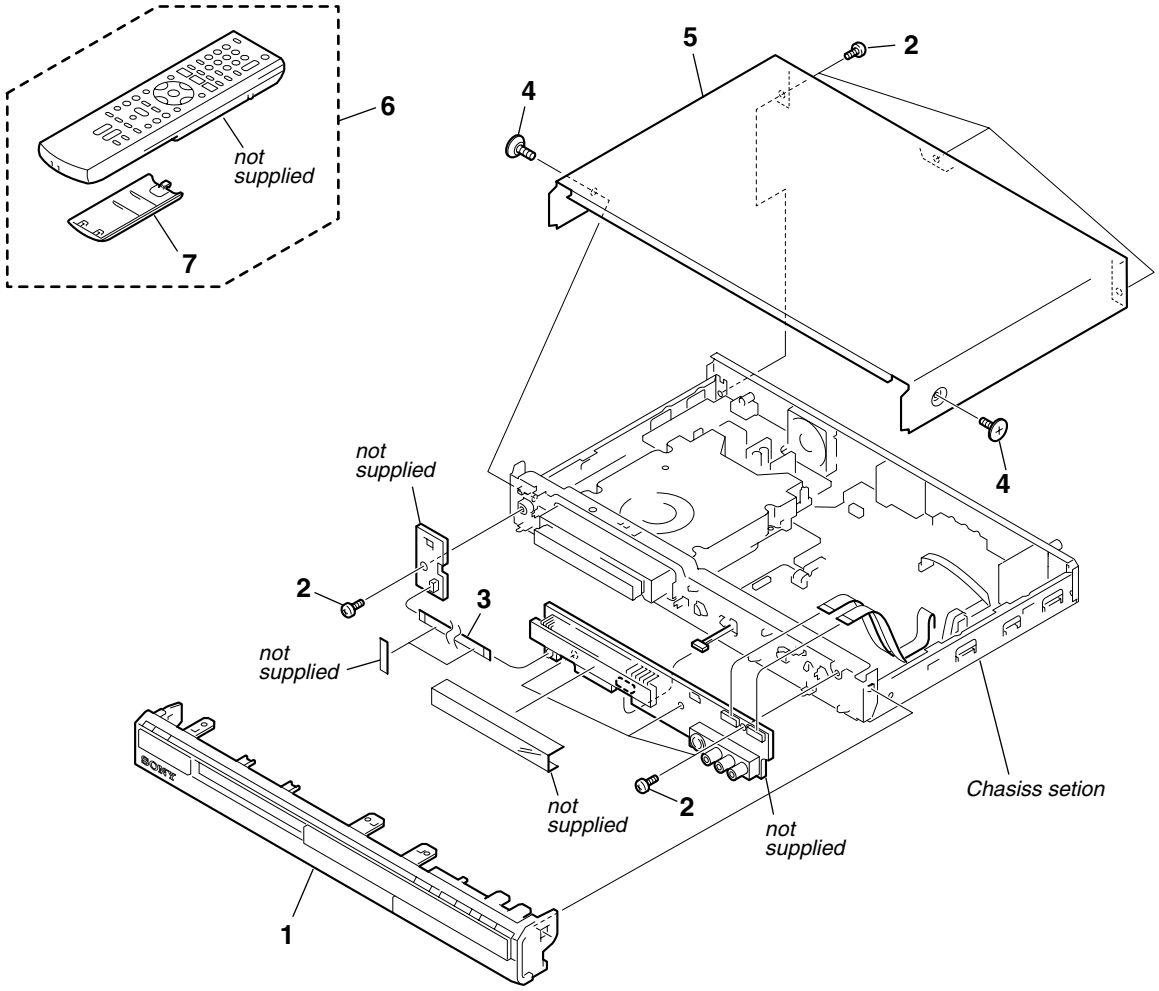
8-1. EXPLODED VIEWS

NOTE:
- -XX, -X mean standardized parts, so they may have some differences from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark ⚠or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

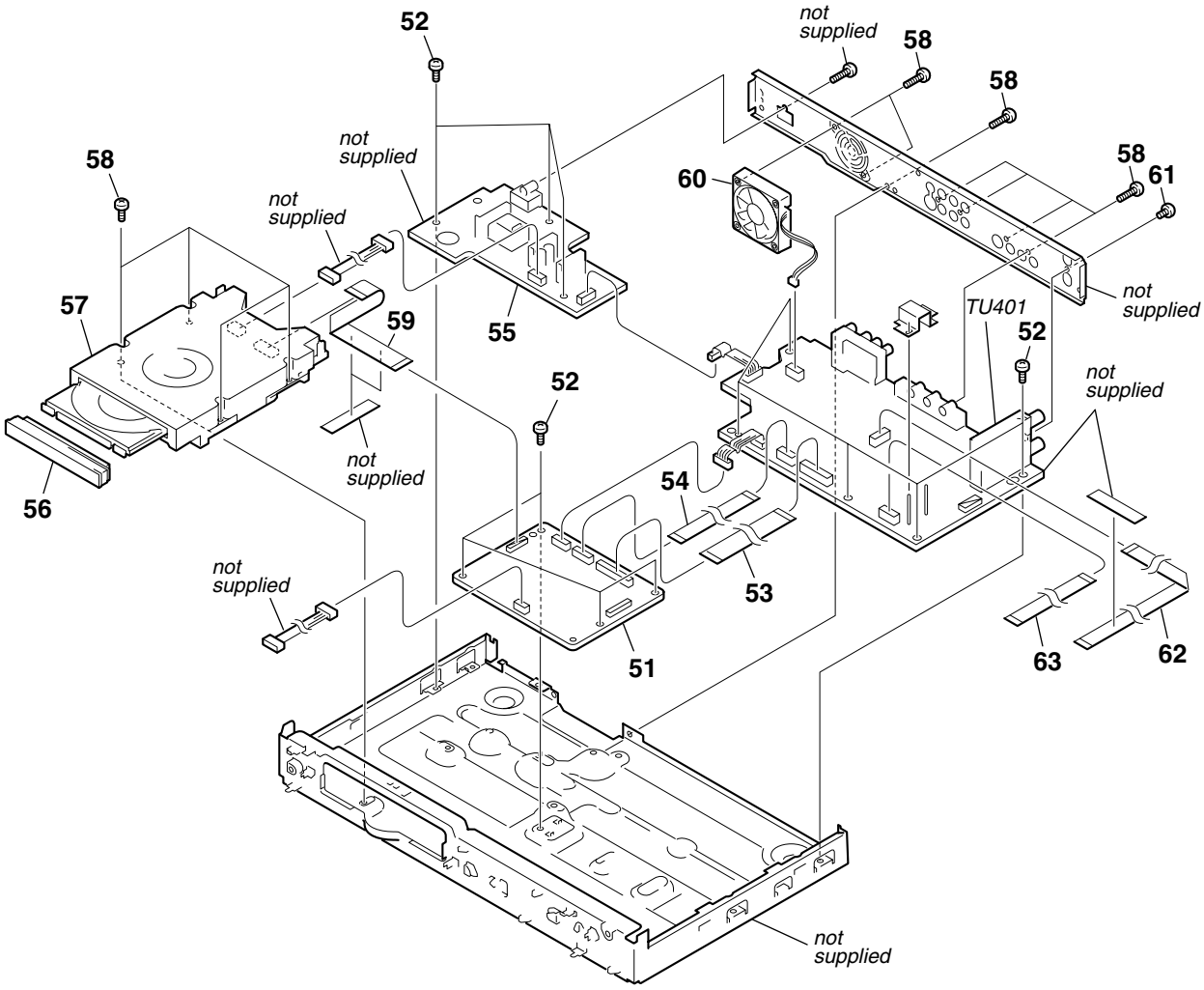
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

8-1-1. OVERALL SECTION



Ref. No.	Part No.	Description	Remarks
1	X-2109-035-1	PANEL ASSY, FRONT	
2	3-077-331-01	+BV3 (3-CR)	
* 3	1-831-508-11	CABLE, FLEXIBLE FLAT (FLR-006)	
4	3-070-883-41	SCREW, TAPPING	
5	A-1176-906-A	CASE BLOCK ASSY (SERVICE USE)	
6	1-479-551-11	REMOTE COMMANDER (RMT-D229A)	
7	2-658-476-01	COVER, BATTERY (FOR RMT-D229A)	

8-1-2. CHASSIS SECTION



Ref. No.	Part No.	Description	Remarks
51	A-1183-535-A	RD-60 BOARD, COMPLETE	
52	3-077-331-01	+BV3 (3-CR)	
* 53	1-831-411-11	CABLE, FLEXIBLE FLAT (FRA-005)	
* 54	1-831-410-11	CABLE, FLEXIBLE FLAT (FRA-003)	
⚠55	1-468-958-11	POWER BLOCK	
56	X-2109-036-1	COVER ASSY, TRAY	
57	1-797-413-11	DRIVE, DVD DRW-V35A	

Ref. No.	Part No.	Description	Remarks
58	3-077-331-31	+BV3 (3-CR)	
59	1-832-951-12	CABLE, FLEXIBLE FLAT (FRD-010)	
60	1-787-290-21	FAN, D.C	
61	3-088-023-01	+B3 (3-CR)	
* 62	1-831-509-11	CABLE, FLEXIBLE FLAT (FAR-002)	
* 63	1-831-510-11	CABLE, FLEXIBLE FLAT (FAR-003)	
TU401	1-693-697-11	TUNER (TMFH4X701A)	

Note :	**Note :**
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.	Les composants identifiés par une marque ⚠ sont critiques pour la sécurité. Ne les remplacer que par une pièce portant le numéro spécifié.

8-2. ELECTRICAL PARTS LIST

NOTE:

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- -XX, -X mean standardized parts, so they may have some difference from the original one.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- CAPACITORS:
  uF: µF
- COILS
  uH: µH
- RESISTORS
  All resistors are in ohms.
  METAL: metal-film resistor
  METAL OXIDE: Metal Oxide-film resistor
  F: nonflammable
- SEMICONDUCTORS
  In each case, u: µ, for example:
  uA...: µA... , uPA... , µPA... ,
  uPB... , µPB... , uPC... , µPC... ,
  uPD..., µPD...

When indicating parts by reference number, please include the board name.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
		AV-100 BOARD, COMPLETE(NOT SUPPLIED)			
		**********			
		< CAPACITOR >			
C117	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C118	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C119	1-100-591-91	CERAMIC CHIP	1uF	10%	25V
C120	1-100-591-91	CERAMIC CHIP	1uF	10%	25V
C123	1-126-947-11	ELECT	47uF	20%	35V
C124	1-126-925-91	ELECT	470uF	20%	10V
C125	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C201	1-126-947-11	ELECT	47uF	20%	35V
C202	1-126-947-11	ELECT	47uF	20%	35V
C205	1-126-947-11	ELECT	47uF	20%	35V
C206	1-126-947-11	ELECT	47uF	20%	35V
C207	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C208	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C209	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C210	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C211	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C212	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C213	1-126-947-11	ELECT	47uF	20%	35V
C214	1-126-947-11	ELECT	47uF	20%	35V
C215	1-126-947-11	ELECT	47uF	20%	35V
C216	1-126-947-11	ELECT	47uF	20%	35V
C217	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C218	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C301	1-126-947-11	ELECT	47uF	20%	35V
C304	1-126-933-11	ELECT	100uF	20%	16V
C306	1-104-662-91	ELECT	22uF	20%	25V
C307	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C308	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C309	1-126-947-11	ELECT	47uF	20%	35V
C310	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C311	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C312	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C313	1-164-739-11	CERAMIC CHIP	560PF	5%	50V
C314	1-164-218-11	CERAMIC CHIP	180PF	5%	50V
C315	1-164-218-11	CERAMIC CHIP	180PF	5%	50V
C316	1-126-947-11	ELECT	47uF	20%	35V
C317	1-126-947-11	ELECT	47uF	20%	35V
C318	1-126-934-11	ELECT	220uF	20%	16V
C319	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C320	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C321	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C324	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C325	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C329	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C330	1-162-927-11	CERAMIC CHIP	100PF	5%	50V
C336	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C408	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C412	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C413	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C414	1-126-963-11	ELECT	4.7uF	20%	50V
C415	1-126-933-11	ELECT	100uF	20%	16V
C416	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C450	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C451	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C452	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C454	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C455	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C456	1-115-416-11	CERAMIC CHIP	0.001uF	5%	25V
C601	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C604	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C606	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C607	1-126-947-11	ELECT	47uF	20%	35V
C613	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C614	1-162-909-11	CERAMIC CHIP	4PF	0.25PF	50V
C615	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C616	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C617	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C618	1-126-947-11	ELECT	47uF	20%	35V
C619	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C620	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C621	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C622	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C623	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C624	1-162-923-11	CERAMIC CHIP	47PF	5%	50V
C625	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C626	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C627	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C628	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C629	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C630	1-125-891-11	CERAMIC CHIP	0.47uF	10%	10V
C631	1-162-964-11	CERAMIC CHIP	0.001uF	10%	50V
C632	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C633	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C634	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C635	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C639	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C641	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C646	1-162-963-11	CERAMIC CHIP	680PF	10%	50V
C650	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C651	1-126-926-11	ELECT	1000uF	20%	10V

Ref. No.	Part No.	Description			Remarks
C652	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C655	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C657	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C658	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C701	1-126-947-11	ELECT	47uF	20%	35V
C702	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C703	1-162-970-11	CERAMIC CHIP	0.01uF	10%	25V
C705	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C706	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C707	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C709	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C710	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C711	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C712	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C713	1-107-696-91	ELECT	47uF	20%	16V
C714	1-126-947-11	ELECT	47uF	20%	35V
C715	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C716	1-126-947-11	ELECT	47uF	20%	35V
C717	1-126-947-11	ELECT	47uF	20%	35V
C718	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C720	1-126-947-11	ELECT	47uF	20%	35V
C721	1-126-947-11	ELECT	47uF	20%	35V
C722	1-126-964-11	ELECT	10uF	20%	50V
C723	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C724	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C725	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C726	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C727	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C728	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C730	1-104-662-91	ELECT	22uF	20%	25V
C731	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C732	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C733	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C734	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C735	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C736	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C737	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C738	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C739	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C740	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C741	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C742	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C743	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C744	1-126-947-11	ELECT	47uF	20%	35V
C745	1-126-947-11	ELECT	47uF	20%	35V
C746	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C747	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C748	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C749	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C750	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C751	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C752	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C753	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C756	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C758	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C759	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C762	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C767	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C772	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C774	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C775	1-126-947-11	ELECT	47uF	20%	35V
C1452	1-107-826-11	CERAMIC CHIP	0.1uF	10%	16V
C1453	1-165-908-11	CERAMIC CHIP	1uF	10%	10V

< CONNECTOR >

Ref. No.	Part No.	Description
CN103	1-794-509-11	PIN, CONNECTOR (PC BOARD) (3P)
CN104	1-784-641-11	CONNECTOR, BOARD TO BOARD 11P
* CN601	1-764-643-21	PIN, CONNECTOR (SMD) 11P
CN602	1-774-766-61	CONNECTOR, FFC/FPC 11P

< DIODE >

Ref. No.	Part No.	Description
D101	8-719-073-34	DIODE EC21QS03L-TE12L
D201	8-719-069-54	DIODE UDZSTE-175.1B
D301	6-501-115-01	DIODE BAS16-03W
D303	6-501-115-01	DIODE BAS16-03W
D701	6-501-115-01	DIODE BAS16-03W
D702	8-719-067-40	DIODE STZ6.8N-T146
D703	8-719-053-18	DIODE 1SR154-400TE-25
D704	8-719-053-18	DIODE 1SR154-400TE-25
D706	8-719-067-40	DIODE STZ6.8N-T146
D714	8-719-067-40	DIODE STZ6.8N-T146
D715	8-719-067-40	DIODE STZ6.8N-T146
D717	8-719-067-40	DIODE STZ6.8N-T146
D721	8-719-067-40	DIODE STZ6.8N-T146
D724	8-719-067-40	DIODE STZ6.8N-T146
D725	8-719-067-40	DIODE STZ6.8N-T146
D726	8-719-067-40	DIODE STZ6.8N-T146
D727	8-719-067-40	DIODE STZ6.8N-T146
D728	8-719-067-40	DIODE STZ6.8N-T146
D731	8-719-067-40	DIODE STZ6.8N-T146
D732	8-719-067-40	DIODE STZ6.8N-T146

< IC >

Ref. No.	Part No.	Description
IC104	6-708-913-01	IC TK73400AU3G0L-C
IC107	6-707-208-01	IC TK11100CSCB-G
IC201	8-759-833-99	IC MC74HC4052ADTR2
IC202	8-759-100-96	IC uPC4558G2
IC203	8-759-100-96	IC uPC4558G2
IC302	8-759-100-96	IC uPC4558G2
IC303	6-705-313-01	IC S-T111B50MC-OHJTFG
IC402	6-706-237-01	IC PQ1MX55M2SPQ
IC601	6-706-673-01	IC S-80852CNMC-B9DT2G
IC603	6-806-752-01	IC M306H5MC-C34FP
* IC604	6-708-842-01	IC S-24CS04AFJ-TB-G
* IC605	6-708-948-01	IC R2051S03-E2-F
IC606	8-759-649-46	IC SN74AHC1G08DCKR
IC701	6-708-957-01	IC TK72233CMCL-G
* IC702	6-708-890-01	IC LA73036M-TBA-E

< COIL >

Ref. No.	Part No.	Description	
L402	1-469-967-21	INDUCTOR	10uH
L406	1-414-856-11	INDUCTOR	10uH
L601	1-412-533-21	INDUCTOR	47uH
L602	1-412-533-21	INDUCTOR	47uH
L701	1-412-060-11	INDUCTOR	22uH
L702	1-469-967-21	INDUCTOR	10uH
L703	1-469-967-21	INDUCTOR	10uH
L704	1-469-967-21	INDUCTOR	10uH

Ref. No.	Part No.	Description			Remarks
		< IC LINK >			
⚠PS102	1-576-570-21	FUSE, MICRO (1608 TYPE)			
⚠PS103	1-576-570-21	FUSE, MICRO (1608 TYPE)			
⚠PS602	1-576-570-21	FUSE, MICRO (1608 TYPE)			
		< TRANSISTOR >			
Q101	8-729-421-19	TRANSISTOR	UN2213		
Q301	8-729-424-08	TRANSISTOR	UN2111		
Q302	8-729-921-80	TRANSISTOR	2SD1781K-T146-QR		
Q303	6-550-286-01	TRANSISTOR	BC847CE6327		
Q304	8-729-045-17	TRANSISTOR	2SB1561T100Q		
Q305	6-551-199-01	TRANSISTOR	BCR148-E6327		
Q307	8-729-027-53	TRANSISTOR	DTC124TKA-T146		
Q309	6-551-287-01	TRANSISTOR	2SD2704K-T146		
Q310	6-551-287-01	TRANSISTOR	2SD2704K-T146		
Q311	6-550-280-01	TRANSISTOR	BC857CE6327		
Q313	6-550-286-01	TRANSISTOR	BC847CE6327		
Q401	6-550-286-01	TRANSISTOR	BC847CE6327		
Q405	6-550-286-01	TRANSISTOR	BC847CE6327		
Q407	6-551-199-01	TRANSISTOR	BCR148-E6327		
Q601	6-551-199-01	TRANSISTOR	BCR148-E6327		
Q616	8-729-904-87	TRANSISTOR	2SB1197K-R		
Q702	6-550-286-01	TRANSISTOR	BC847CE6327		
Q705	6-550-280-01	TRANSISTOR	BC857CE6327		
Q707	6-550-286-01	TRANSISTOR	BC847CE6327		
Q708	6-550-286-01	TRANSISTOR	BC847CE6327		
Q709	6-550-286-01	TRANSISTOR	BC847CE6327		
Q710	6-550-286-01	TRANSISTOR	BC847CE6327		
Q711	6-550-286-01	TRANSISTOR	BC847CE6327		
Q715	8-729-904-87	TRANSISTOR	2SB1197K-R		
Q716	6-551-199-01	TRANSISTOR	BCR148-E6327		
		< RESISTOR >			
R101	1-216-295-91	SHORT CHIP	0		
R111	1-216-833-11	METAL CHIP	10K	5%	1/10W
R113	1-218-897-11	METAL CHIP	120K	0.5%	1/10W
R114	1-218-875-11	METAL CHIP	15K	0.5%	1/10W
R115	1-218-869-11	METAL CHIP	8.2K	0.5%	1/10W
R120	1-216-864-11	SHORT CHIP	0		
R121	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R122	1-218-873-11	METAL CHIP	12K	0.5%	1/10W
R135	1-216-295-91	SHORT CHIP	0		
R137	1-216-295-91	SHORT CHIP	0		
R140	1-216-295-91	SHORT CHIP	0		
R142	1-216-295-91	SHORT CHIP	0		
R144	1-216-295-91	SHORT CHIP	0		
R145	1-216-295-91	SHORT CHIP	0		
R146	1-216-295-91	SHORT CHIP	0		
R148	1-216-295-91	SHORT CHIP	0		
R207	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R208	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R209	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R212	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R213	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R214	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R217	1-216-821-11	METAL CHIP	1K	5%	1/10W
R220	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R221	1-218-879-11	METAL CHIP	22K	0.5%	1/10W

Ref. No.	Part No.	Description			Remarks
R222	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R223	1-218-879-11	METAL CHIP	22K	0.5%	1/10W
R224	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R225	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R226	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R227	1-218-863-11	METAL CHIP	4.7K	0.5%	1/10W
R228	1-216-849-11	METAL CHIP	220K	5%	1/10W
R229	1-216-849-11	METAL CHIP	220K	5%	1/10W
R230	1-216-849-11	METAL CHIP	220K	5%	1/10W
R231	1-216-849-11	METAL CHIP	220K	5%	1/10W
R232	1-216-849-11	METAL CHIP	220K	5%	1/10W
R233	1-216-849-11	METAL CHIP	220K	5%	1/10W
R234	1-216-864-11	SHORT CHIP	0		
R235	1-216-864-11	SHORT CHIP	0		
R304	1-216-849-11	METAL CHIP	220K	5%	1/10W
R305	1-216-833-11	METAL CHIP	10K	5%	1/10W
R306	1-216-833-11	METAL CHIP	10K	5%	1/10W
R307	1-216-833-11	METAL CHIP	10K	5%	1/10W
R308	1-216-841-11	METAL CHIP	47K	5%	1/10W
R309	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R310	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R311	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R312	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R313	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R314	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R315	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R316	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R317	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R318	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R320	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R321	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R323	1-218-865-11	METAL CHIP	5.6K	0.5%	1/10W
R326	1-216-817-11	METAL CHIP	470	5%	1/10W
R327	1-216-817-11	METAL CHIP	470	5%	1/10W
R330	1-216-841-11	METAL CHIP	47K	5%	1/10W
R331	1-216-841-11	METAL CHIP	47K	5%	1/10W
R332	1-216-833-11	METAL CHIP	10K	5%	1/10W
R334	1-216-833-11	METAL CHIP	10K	5%	1/10W
R335	1-216-841-11	METAL CHIP	47K	5%	1/10W
R338	1-216-833-11	METAL CHIP	10K	5%	1/10W
R340	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R343	1-216-845-11	METAL CHIP	100K	5%	1/10W
R345	1-216-821-11	METAL CHIP	1K	5%	1/10W
R346	1-216-821-11	METAL CHIP	1K	5%	1/10W
R347	1-216-821-11	METAL CHIP	1K	5%	1/10W
R348	1-216-813-11	METAL CHIP	220	5%	1/10W
R350	1-216-807-11	METAL CHIP	68	5%	1/10W
R352	1-216-817-11	METAL CHIP	470	5%	1/10W
R354	1-216-817-11	METAL CHIP	470	5%	1/10W
R362	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R364	1-216-845-11	METAL CHIP	100K	5%	1/10W
R365	1-216-839-11	METAL CHIP	33K	5%	1/10W
R366	1-216-821-11	METAL CHIP	1K	5%	1/10W
R367	1-216-864-11	SHORT CHIP	0		
R368	1-216-864-11	SHORT CHIP	0		

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
R405	1-216-821-11	METAL CHIP	1K	5%	1/10W
R410	1-216-809-11	METAL CHIP	100	5%	1/10W
R411	1-216-864-11	SHORT CHIP	0		
R412	1-216-809-11	METAL CHIP	100	5%	1/10W
R414	1-216-845-11	METAL CHIP	100K	5%	1/10W
R415	1-216-838-11	METAL CHIP	27K	5%	1/10W
R416	1-216-864-11	SHORT CHIP	0		
R428	1-216-817-11	METAL CHIP	470	5%	1/10W
R429	1-216-817-11	METAL CHIP	470	5%	1/10W
R482	1-216-809-11	METAL CHIP	100	5%	1/10W
R483	1-216-809-11	METAL CHIP	100	5%	1/10W
R603	1-216-833-11	METAL CHIP	10K	5%	1/10W
R604	1-216-841-11	METAL CHIP	47K	5%	1/10W
R606	1-216-833-11	METAL CHIP	10K	5%	1/10W
R607	1-216-833-11	METAL CHIP	10K	5%	1/10W
R609	1-216-845-11	METAL CHIP	100K	5%	1/10W
R610	1-216-809-11	METAL CHIP	100	5%	1/10W
R611	1-216-833-11	METAL CHIP	10K	5%	1/10W
R613	1-216-833-11	METAL CHIP	10K	5%	1/10W
R614	1-216-833-11	METAL CHIP	10K	5%	1/10W
R615	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R616	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R617	1-216-833-11	METAL CHIP	10K	5%	1/10W
R618	1-218-875-11	METAL CHIP	15K	0.5%	1/10W
R619	1-216-833-11	METAL CHIP	10K	5%	1/10W
R620	1-216-833-11	METAL CHIP	10K	5%	1/10W
R621	1-216-833-11	METAL CHIP	10K	5%	1/10W
R622	1-216-833-11	METAL CHIP	10K	5%	1/10W
R623	1-216-864-11	SHORT CHIP	0		
R624	1-216-809-11	METAL CHIP	100	5%	1/10W
R626	1-216-864-11	SHORT CHIP	0		
R627	1-216-833-11	METAL CHIP	10K	5%	1/10W
R628	1-216-817-11	METAL CHIP	470	5%	1/10W
R629	1-216-864-11	SHORT CHIP	0		
R630	1-216-809-11	METAL CHIP	100	5%	1/10W
R631	1-216-809-11	METAL CHIP	100	5%	1/10W
R632	1-216-809-11	METAL CHIP	100	5%	1/10W
R633	1-216-809-11	METAL CHIP	100	5%	1/10W
R635	1-216-809-11	METAL CHIP	100	5%	1/10W
R636	1-216-809-11	METAL CHIP	100	5%	1/10W
R637	1-218-289-11	METAL CHIP	510	5%	1/10W
R639	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R642	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R643	1-216-833-11	METAL CHIP	10K	5%	1/10W
R644	1-216-809-11	METAL CHIP	100	5%	1/10W
R645	1-216-833-11	METAL CHIP	10K	5%	1/10W
R646	1-216-833-11	METAL CHIP	10K	5%	1/10W
R647	1-216-817-11	METAL CHIP	470	5%	1/10W
R649	1-216-809-11	METAL CHIP	100	5%	1/10W
R651	1-216-809-11	METAL CHIP	100	5%	1/10W
R656	1-216-821-11	METAL CHIP	1K	5%	1/10W
R658	1-216-809-11	METAL CHIP	100	5%	1/10W
R659	1-216-809-11	METAL CHIP	100	5%	1/10W
R660	1-216-809-11	METAL CHIP	100	5%	1/10W
R661	1-216-809-11	METAL CHIP	100	5%	1/10W
R662	1-216-809-11	METAL CHIP	100	5%	1/10W
R663	1-216-809-11	METAL CHIP	100	5%	1/10W
R664	1-216-809-11	METAL CHIP	100	5%	1/10W
R666	1-216-864-11	SHORT CHIP	0		
R668	1-216-864-11	SHORT CHIP	0		
R669	1-216-833-11	METAL CHIP	10K	5%	1/10W
R670	1-216-833-11	METAL CHIP	10K	5%	1/10W
R671	1-216-845-11	METAL CHIP	100K	5%	1/10W
R672	1-216-833-11	METAL CHIP	10K	5%	1/10W
R673	1-216-833-11	METAL CHIP	10K	5%	1/10W
R674	1-216-833-11	METAL CHIP	10K	5%	1/10W
R675	1-216-833-11	METAL CHIP	10K	5%	1/10W
R676	1-216-833-11	METAL CHIP	10K	5%	1/10W
R677	1-216-833-11	METAL CHIP	10K	5%	1/10W
R678	1-216-845-11	METAL CHIP	100K	5%	1/10W
R680	1-216-833-11	METAL CHIP	10K	5%	1/10W
R682	1-216-833-11	METAL CHIP	10K	5%	1/10W
R685	1-216-809-11	METAL CHIP	100	5%	1/10W
R686	1-216-809-11	METAL CHIP	100	5%	1/10W
R692	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R693	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R697	1-216-833-11	METAL CHIP	10K	5%	1/10W
R698	1-216-833-11	METAL CHIP	10K	5%	1/10W
R705	1-216-864-11	SHORT CHIP	0		
R712	1-218-883-11	METAL CHIP	33K	0.5%	1/10W
R713	1-218-871-11	METAL CHIP	10K	0.5%	1/10W
R714	1-216-855-11	METAL CHIP	680K	5%	1/10W
R715	1-216-841-11	METAL CHIP	47K	5%	1/10W
R716	1-216-845-11	METAL CHIP	100K	5%	1/10W
R718	1-218-867-11	METAL CHIP	6.8K	0.5%	1/10W
R719	1-218-852-11	METAL CHIP	1.6K	0.5%	1/10W
R726	1-216-817-11	METAL CHIP	470	5%	1/10W
R728	1-216-840-11	METAL CHIP	39K	5%	1/10W
R729	1-216-837-11	METAL CHIP	22K	5%	1/10W
R733	1-216-864-11	SHORT CHIP	0		
R736	1-216-801-11	METAL CHIP	22	5%	1/10W
R738	1-216-801-11	METAL CHIP	22	5%	1/10W
R740	1-216-801-11	METAL CHIP	22	5%	1/10W
R742	1-216-801-11	METAL CHIP	22	5%	1/10W
R744	1-216-801-11	METAL CHIP	22	5%	1/10W
R747	1-216-807-11	METAL CHIP	68	5%	1/10W
R749	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R750	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R751	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R752	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R753	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R755	1-216-821-11	METAL CHIP	1K	5%	1/10W
R760	1-216-833-11	METAL CHIP	10K	5%	1/10W
R761	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R764	1-216-864-11	SHORT CHIP	0		
R767	1-216-864-11	SHORT CHIP	0		
R768	1-216-864-11	SHORT CHIP	0		
R771	1-218-285-11	METAL CHIP	75	5%	1/10W
R772	1-216-833-11	METAL CHIP	10K	5%	1/10W
R776	1-216-807-11	METAL CHIP	68	5%	1/10W
R779	1-216-807-11	METAL CHIP	68	5%	1/10W
R780	1-216-807-11	METAL CHIP	68	5%	1/10W
R785	1-216-864-11	SHORT CHIP	0		
R791	1-216-864-11	SHORT CHIP	0		
R795	1-216-864-11	SHORT CHIP	0		
R798	1-216-864-11	SHORT CHIP	0		
R799	1-216-864-11	SHORT CHIP	0		
R1416	1-216-864-11	SHORT CHIP	0		
R1451	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1452	1-218-895-11	METAL CHIP	100K	0.5%	1/10W

Ref. No.	Part No.	Description			Remarks
R1453	1-218-905-11	METAL CHIP	270K	0.5%	1/10W
R1454	1-218-885-11	METAL CHIP	39K	0.5%	1/10W
R1610	1-216-809-11	METAL CHIP	100	5%	1/10W
R1625	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1626	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1627	1-216-864-11	SHORT CHIP	0		
R1629	1-216-817-11	METAL CHIP	470	5%	1/10W
R1630	1-216-817-11	METAL CHIP	470	5%	1/10W
R1632	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1633	1-216-821-11	METAL CHIP	1K	5%	1/10W
R1636	1-216-809-11	METAL CHIP	100	5%	1/10W
R1637	1-216-809-11	METAL CHIP	100	5%	1/10W
R1638	1-216-809-11	METAL CHIP	100	5%	1/10W
R1702	1-218-285-11	METAL CHIP	75	5%	1/10W
R1703	1-218-285-11	METAL CHIP	75	5%	1/10W
R1707	1-216-295-91	SHORT CHIP	0		
R1709	1-216-295-91	SHORT CHIP	0		
R1710	1-216-864-11	SHORT CHIP	0		
R1714	1-216-817-11	METAL CHIP	470	5%	1/10W
R1715	1-216-864-11	SHORT CHIP	0		
R1716	1-216-807-11	METAL CHIP	68	5%	1/10W
R1717	1-216-807-11	METAL CHIP	68	5%	1/10W
R1718	1-216-864-11	SHORT CHIP	0		
R1719	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1720	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1721	1-216-864-11	SHORT CHIP	0		
R1722	1-216-864-11	SHORT CHIP	0		
R1735	1-216-817-11	METAL CHIP	470	5%	1/10W
R1736	1-216-833-11	METAL CHIP	10K	5%	1/10W
R1737	1-216-864-11	SHORT CHIP	0		
		< THERMISTOR >			
TH601	1-803-384-11	THERMISTOR (1608)			
		< TUNER UNIT >			
⚠TU401	1-693-697-11	TUNER (TMFH4X701A)			
		< VIBRATOR >			
* X602	1-813-700-21	VIBRATOR, CRYSTAL 10MHz			
* X603	1-813-698-11	VIBRATOR, CRYSTAL 32.76KHz			
		FL-155 BOARD, COMPLETE(NOT SUPPLIED)			
		**********			
		< CONNECTOR >			
CN3101	1-779-353-51	CONNECTOR, FFC/FPC 5P			
		< SWITCH >			
S3101	1-771-410-21	SWITCH, TACTILE (POWER)			

Ref. No.	Part No.	Description			Remarks
		FR-237 BOARD, COMPLETE(NOT SUPPLIED)			
		**********			
		< CAPACITOR >			
C3008	1-125-972-91	ELECT	100uF	20%	16V
C3012	1-106-363-00	MYLAR	0.0068uF	5%	200V
C3015	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C3016	1-128-131-11	ELECT	22uF	20%	50V
C3018	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C3019	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C3020	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C3021	1-107-726-91	CERAMIC CHIP	0.01uF	10%	16V
C3022	1-115-339-11	CERAMIC CHIP	0.1uF	10%	50V
C3024	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
C3025	1-164-217-11	CERAMIC CHIP	150PF	5%	50V
		< CONNECTOR >			
CN3001	1-779-353-51	CONNECTOR, FFC/FPC 5P			
CN3003	1-785-828-21	CONNECTOR, SQUARE TYPE 4P			
* CN3004	1-580-789-22	PIN, CONNECTOR (SMD) 6P			
		< DIODE >			
D1301	8-719-988-61	DIODE 1SS355TE-17			
D1302	8-719-988-61	DIODE 1SS355TE-17			
D1303	8-719-988-61	DIODE 1SS355TE-17			
D1304	8-719-988-61	DIODE 1SS355TE-17			
D1305	8-719-056-82	DIODE UDZ-TE-17-6.2B			
D3002	8-719-067-40	DIODE STZ6.8N-T146			
D3003	8-719-067-40	DIODE STZ6.8N-T146			
D3004	8-719-067-40	DIODE STZ6.8N-T146			
D3005	8-719-067-40	DIODE STZ6.8N-T146			
D3006	8-719-067-40	DIODE STZ6.8N-T146			
D3007	8-719-067-40	DIODE STZ6.8N-T146			
D3008	6-501-481-01	DIODE SLI-343URT32WST			
D3009	6-501-481-01	DIODE SLI-343URT32WST			
		< IC >			
IC3001	8-759-643-83	IC uPD16315GB-3BS			
* IC3002	6-600-500-01	IC GP1UM28XK0SF			
		< JACK >			
* J3001	1-780-049-11	TERMINAL BOARD (S TERMINAL+3P)			
		< COIL >			
L3001	1-412-537-31	INDUCTOR	100uH		
		< FLUORESCENT INDICATOR TUBE >			
* ND3001	1-519-849-21	INDICATOR TUBE, FLUORESCENT			
		< TRANSISTOR >			
Q3001	8-729-901-88	TRANSISTOR	2SC2411K-CR		
Q3002	8-729-901-88	TRANSISTOR	2SC2411K-CR		
Q3003	8-729-421-22	TRANSISTOR	UN2211		
Q3004	6-550-280-01	TRANSISTOR	BC857CE6327		

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Ref. No.	Part No.	Description			Remarks
		< RESISTOR >			
R3001	1-218-285-11	METAL CHIP	75	5%	1/10W
R3002	1-218-285-11	METAL CHIP	75	5%	1/10W
R3003	1-216-864-11	SHORT CHIP	0		
R3004	1-216-864-11	SHORT CHIP	0		
R3005	1-216-864-11	SHORT CHIP	0		
R3008	1-218-285-11	METAL CHIP	75	5%	1/10W
R3009	1-216-864-11	SHORT CHIP	0		
R3010	1-216-295-91	SHORT CHIP	0		
R3011	1-216-841-11	METAL CHIP	47K	5%	1/10W
R3013	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3014	1-216-841-11	METAL CHIP	47K	5%	1/10W
R3018	1-216-829-11	METAL CHIP	4.7K	5%	1/10W
R3019	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3020	1-216-820-11	METAL CHIP	820	5%	1/10W
R3021	1-216-820-11	METAL CHIP	820	5%	1/10W
R3022	1-216-838-11	METAL CHIP	27K	5%	1/10W
R3024	1-216-295-91	SHORT CHIP	0		
R3026	1-216-864-11	SHORT CHIP	0		
R3027	1-218-855-11	METAL CHIP	2.2K	0.5%	1/10W
R3028	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3029	1-216-827-11	METAL CHIP	3.3K	5%	1/10W
R3030	1-216-830-11	METAL CHIP	5.6K	5%	1/10W
R3031	1-216-864-11	SHORT CHIP	0		
R3032	1-216-864-11	SHORT CHIP	0		
R3033	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3034	1-216-825-11	METAL CHIP	2.2K	5%	1/10W
R3036	1-216-845-11	METAL CHIP	100K	5%	1/10W
R3039	1-216-832-11	METAL CHIP	8.2K	5%	1/10W
R3040	1-216-864-11	SHORT CHIP	0		
R3041	1-216-864-11	SHORT CHIP	0		
R3043	1-216-864-11	SHORT CHIP	0		
		< SWITCH >			
S3001	1-771-410-21	SWITCH, TACTILE (PLAY)			
S3002	1-771-410-21	SWITCH, TACTILE (REC STOP)			
S3003	1-771-410-21	SWITCH, TACTILE (REC)			
S3004	1-771-410-21	SWITCH, TACTILE (STOP)			
S3005	1-771-410-21	SWITCH, TACTILE			
S3006	1-771-410-21	SWITCH, TACTILE (OPEN/CLOSE)			
S3007	1-771-410-21	SWITCH, TACTILE (CH+)			
S3008	1-771-410-21	SWITCH, TACTILE (CH-)			
		< TRANSFORMER >			
* T3001	1-445-017-11	TRANSFORMER, DC-DC CONVERTER			
	A-1183-535-A	RD-060 BOARD, COMPLETE			
		**********			
		< CAPACITOR >			
C101	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C102	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C103	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C107	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C109	1-126-246-11	ELECT CHIP	220uF	20%	4V

Ref. No.	Part No.	Description			Remarks
C110	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C111	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C112	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C113	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C114	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C115	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C116	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C117	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C118	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C119	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C120	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C121	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C122	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C123	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C124	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C125	1-128-994-21	ELECT CHIP	47uF	20%	10V
C126	1-126-209-11	ELECT CHIP	100uF	20%	4V
C127	1-128-994-21	ELECT CHIP	47uF	20%	10V
C128	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C129	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C130	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C131	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C132	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C133	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C134	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C135	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C136	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C137	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C138	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C139	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C140	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C141	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C142	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C143	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C144	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C145	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C146	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C147	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C148	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C149	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C150	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C151	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C152	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C153	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C154	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C155	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C156	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C157	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C158	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C159	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C160	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C161	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C162	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C163	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C164	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C165	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C166	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C167	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C168	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C169	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V

Ref. No.	Part No.	Description			Remarks
C170	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C171	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C172	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C173	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C174	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C175	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C176	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C177	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C188	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C189	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C190	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C191	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C192	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C193	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C194	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C195	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C196	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C197	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C198	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C199	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C501	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C502	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C504	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C505	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C506	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C508	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C601	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C602	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C603	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C606	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C607	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C609	1-128-994-21	ELECT CHIP	47uF	20%	10V
C610	1-128-994-21	ELECT CHIP	47uF	20%	10V
C611	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C614	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C615	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C616	1-164-937-11	CERAMIC CHIP	0.001uF	10%	50V
C617	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C618	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C619	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C620	1-162-960-11	CERAMIC CHIP	220PF	10%	50V
C621	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C622	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C701	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C702	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C703	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C704	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C705	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C706	1-164-849-11	CERAMIC CHIP	9PF	0.5PF	50V
C707	1-164-849-11	CERAMIC CHIP	9PF	0.5PF	50V
C708	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C710	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C711	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C712	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C713	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C714	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C715	1-125-837-91	CERAMIC CHIP	1uF	10%	6.3V
C716	1-112-001-81	CERAMIC CHIP	270PF	5%	50V
C803	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C804	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C805	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C806	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C807	1-164-854-11	CERAMIC CHIP	15PF	5%	50V
C808	1-112-864-81	CERAMIC CHIP	14PF	5%	50V
C809	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C810	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C811	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C812	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C813	1-124-779-00	ELECT CHIP	10uF	20%	16V
C816	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C817	1-128-994-21	ELECT CHIP	47uF	20%	10V
C1006	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1008	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1009	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1010	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1011	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1012	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1013	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1014	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1015	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1028	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1029	1-137-710-11	CERAMIC CHIP	10uF	20%	6.3V
C1030	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1031	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1032	1-125-777-11	CERAMIC CHIP	0.1uF	10%	10V
C1033	1-127-715-91	CERAMIC CHIP	0.22uF	10%	16V
C1034	1-165-887-91	CERAMIC CHIP	0.22uF	10%	6.3V
C1035	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
C1036	1-165-908-11	CERAMIC CHIP	1uF	10%	10V
C1037	1-164-943-81	CERAMIC CHIP	0.01uF	10%	16V
* C1038	1-112-833-11	ELECT CHIP	68uF	20%	16V
		< CONNECTOR >			
CN101	1-818-857-51	CONNECTOR, FFC/FPC 40P			
CN601	1-816-339-21	CONNECTOR, BOARD TO BOARD 9P			
CN701	1-573-806-21	PIN, CONNECTOR (1.5MM) (SMD) 6P			
		< DIODE >			
D503	8-719-073-35	DIODE RB551V-30TE-17			
		< FERRITE BEAD >			
FB101	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB103	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB106	1-469-670-21	FERRITE, EMI (SMD) (2012)			
FB107	1-469-670-21	FERRITE, EMI (SMD) (2012)			
FB110	1-469-670-21	FERRITE, EMI (SMD) (2012)			
FB111	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB112	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB602	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB603	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB604	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB605	1-400-794-21	EMI FERRITE (SMD) (1608)			
FB606	1-469-084-21	FERRITE 0mH			
		< FLUORESCENT INDICATOR TUBE >			
FL501	1-234-867-11	FILTER, EMI REMOVAL (SMD)			
FL702	1-234-867-11	FILTER, EMI REMOVAL (SMD)			
FL801	1-234-867-11	FILTER, EMI REMOVAL (SMD)			

Ref. No.	Part No.	Description			Remarks
		< IC >			
IC101	6-702-302-01	IC TK11133CSCL-G			
IC103	6-708-896-01	IC R8A34012BG			
IC105	6-708-305-01	IC K4H511638C-UCB3T			
IC106	6-708-305-01	IC K4H511638C-UCB3T			
IC108	6-708-935-01	IC MM1762FHBE			
IC109	6-702-302-01	IC TK11133CSCL-G			
* IC501	6-708-956-01	IC HN29V128A0ABP-5E			
* IC502	6-708-924-01	IC S29GL256N90TFIR20			
IC601	6-708-889-01	IC MP2105DJ-LF-Z			
IC602	6-706-237-01	IC PQ1MX55M2SPQ			
IC604	8-759-660-23	IC SN74HCT08APWR			
IC605	8-759-548-99	IC SN74LV08APWR			
IC606	6-703-224-01	IC S-80828CNNB-B8NT2G			
IC701	6-706-365-01	IC uPD72852AGB-8EU-A			
* IC802	6-708-929-01	IC ICS650G-42LFT			
IC803	6-708-888-01	IC WM8590GEDS/RV			
		< COIL >			
L101	1-469-555-21	INDUCTOR	10uH		
L102	1-469-555-21	INDUCTOR	10uH		
L601	1-419-630-21	INDUCTOR	4.7uH		
L602	1-400-073-21	INDUCTOR	4.7uH		
		< LINE FILTER >			
LF701	1-400-476-11	COMMON MODE CHOKE COIL			
		< TRANSISTOR >			
Q601	6-550-280-01	TRANSISTOR	BC857CE6327		
Q602	6-550-280-01	TRANSISTOR	BC857CE6327		
Q603	6-550-280-01	TRANSISTOR	BC857CE6327		
Q604	6-550-280-01	TRANSISTOR	BC857CE6327		
Q605	6-550-280-01	TRANSISTOR	BC857CE6327		
		< RESISTOR >			
R103	1-218-990-81	SHORT CHIP	0		
R104	1-218-990-81	SHORT CHIP	0		
R105	1-218-990-81	SHORT CHIP	0		
R106	1-218-941-81	RES-CHIP	100	5%	1/16W
R107	1-218-990-81	SHORT CHIP	0		
R108	1-218-990-81	SHORT CHIP	0		
R109	1-218-941-81	RES-CHIP	100	5%	1/16W
R110	1-218-990-81	SHORT CHIP	0		
R111	1-218-941-81	RES-CHIP	100	5%	1/16W
R112	1-218-990-81	SHORT CHIP	0		
R113	1-218-953-11	RES-CHIP	1K	5%	1/16W
R114	1-218-965-11	RES-CHIP	10K	5%	1/16W
R115	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R116	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R123	1-218-965-11	RES-CHIP	10K	5%	1/16W
R124	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R125	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R126	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R127	1-218-957-11	RES-CHIP	2.2K	5%	1/16W
R128	1-218-990-81	SHORT CHIP	0		
R129	1-218-935-11	RES-CHIP	33	5%	1/16W
R130	1-218-990-81	SHORT CHIP	0		
R131	1-218-933-11	RES-CHIP	22	5%	1/16W
R132	1-218-933-11	RES-CHIP	22	5%	1/16W
R133	1-218-990-81	SHORT CHIP	0		
R134	1-218-933-11	RES-CHIP	22	5%	1/16W
R135	1-218-990-81	SHORT CHIP	0		
R136	1-218-935-11	RES-CHIP	33	5%	1/16W
R137	1-218-973-11	RES-CHIP	47K	5%	1/16W
R138	1-218-973-11	RES-CHIP	47K	5%	1/16W
R139	1-218-973-11	RES-CHIP	47K	5%	1/16W
R140	1-218-973-11	RES-CHIP	47K	5%	1/16W
R141	1-218-973-11	RES-CHIP	47K	5%	1/16W
R142	1-218-973-11	RES-CHIP	47K	5%	1/16W
R143	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R145	1-218-973-11	RES-CHIP	47K	5%	1/16W
R146	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R147	1-218-933-11	RES-CHIP	22	5%	1/16W
R148	1-218-933-11	RES-CHIP	22	5%	1/16W
R149	1-218-939-11	RES-CHIP	68	5%	1/16W
R160	1-218-990-81	SHORT CHIP	0		
R161	1-218-990-81	SHORT CHIP	0		
R162	1-218-851-11	METAL CHIP	1.5K	0.5%	1/10W
R163	1-218-851-11	METAL CHIP	1.5K	0.5%	1/10W
R164	1-211-986-11	METAL CHIP	51	0.5%	1/10W
R165	1-211-989-11	METAL CHIP	68	0.5%	1/10W
R166	1-218-827-11	METAL CHIP	150	0.5%	1/10W
R167	1-218-827-11	METAL CHIP	150	0.5%	1/10W
R168	1-218-827-11	METAL CHIP	150	0.5%	1/10W
R169	1-218-827-11	METAL CHIP	150	0.5%	1/10W
R170	1-218-827-11	METAL CHIP	150	0.5%	1/10W
R171	1-218-935-11	RES-CHIP	33	5%	1/16W
R172	1-218-933-11	RES-CHIP	22	5%	1/16W
R173	1-218-933-11	RES-CHIP	22	5%	1/16W
R174	1-218-933-11	RES-CHIP	22	5%	1/16W
R175	1-218-933-11	RES-CHIP	22	5%	1/16W
R180	1-218-965-11	RES-CHIP	10K	5%	1/16W
R181	1-218-965-11	RES-CHIP	10K	5%	1/16W
R182	1-218-945-11	RES-CHIP	220	5%	1/16W
R183	1-218-945-11	RES-CHIP	220	5%	1/16W
R190	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R191	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R192	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R193	1-208-699-11	METAL CHIP	4.7K	0.5%	1/16W
R196	1-218-953-11	RES-CHIP	1K	5%	1/16W
R197	1-216-864-11	SHORT CHIP	0		
R198	1-218-933-11	RES-CHIP	22	5%	1/16W
R504	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R505	1-218-990-81	SHORT CHIP	0		
R506	1-218-965-11	RES-CHIP	10K	5%	1/16W
R507	1-218-990-81	SHORT CHIP	0		
R513	1-218-965-11	RES-CHIP	10K	5%	1/16W
R516	1-218-990-81	SHORT CHIP	0		
R517	1-218-990-81	SHORT CHIP	0		
R518	1-218-965-11	RES-CHIP	10K	5%	1/16W
R519	1-218-965-11	RES-CHIP	10K	5%	1/16W
R522	1-216-864-11	SHORT CHIP	0		
R523	1-218-965-11	RES-CHIP	10K	5%	1/16W
R524	1-218-990-81	SHORT CHIP	0		
R525	1-218-990-81	SHORT CHIP	0		
R532	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R533	1-218-990-81	SHORT CHIP	0		
R535	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R546	1-218-990-81	SHORT CHIP	0		
R547	1-218-990-81	SHORT CHIP	0		

Ref. No.	Part No.	Description			Remarks
R548	1-218-990-81	SHORT CHIP	0		
R549	1-218-990-81	SHORT CHIP	0		
R551	1-218-990-81	SHORT CHIP	0		
R552	1-218-990-81	SHORT CHIP	0		
R553	1-218-990-81	SHORT CHIP	0		
R554	1-218-990-81	SHORT CHIP	0		
R555	1-218-990-81	SHORT CHIP	0		
R556	1-218-990-81	SHORT CHIP	0		
R557	1-218-990-81	SHORT CHIP	0		
R558	1-218-990-81	SHORT CHIP	0		
R560	1-218-990-81	SHORT CHIP	0		
R561	1-218-990-81	SHORT CHIP	0		
R603	1-218-942-11	RES-CHIP	120	5%	1/16W
R605	1-218-942-11	RES-CHIP	120	5%	1/16W
R607	1-218-942-11	RES-CHIP	120	5%	1/16W
R609	1-218-942-11	RES-CHIP	120	5%	1/16W
R611	1-218-942-11	RES-CHIP	120	5%	1/16W
R612	1-218-951-11	RES-CHIP	680	5%	1/16W
R613	1-218-990-81	SHORT CHIP	0		
R614	1-218-951-11	RES-CHIP	680	5%	1/16W
R615	1-218-990-81	SHORT CHIP	0		
R616	1-218-990-81	SHORT CHIP	0		
R617	1-218-951-11	RES-CHIP	680	5%	1/16W
R618	1-218-951-11	RES-CHIP	680	5%	1/16W
R619	1-218-990-81	SHORT CHIP	0		
R620	1-218-990-81	SHORT CHIP	0		
R621	1-218-951-11	RES-CHIP	680	5%	1/16W
R623	1-218-978-11	RES-CHIP	120K	5%	1/16W
* R624	1-208-940-81	METAL CHIP	160K	0.5%	1/16W
R625	1-218-990-81	SHORT CHIP	0		
R626	1-208-713-11	METAL CHIP	18K	0.5%	1/16W
R627	1-208-911-11	METAL CHIP	10K	0.5%	1/16W
R628	1-216-295-91	SHORT CHIP	0		
R635	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R638	1-218-990-81	SHORT CHIP	0		
R639	1-218-990-81	SHORT CHIP	0		
R640	1-218-990-81	SHORT CHIP	0		
R641	1-218-990-81	SHORT CHIP	0		
R642	1-218-977-11	RES-CHIP	100K	5%	1/16W
R643	1-218-990-81	SHORT CHIP	0		
R644	1-218-990-81	SHORT CHIP	0		
R645	1-218-990-81	SHORT CHIP	0		
R646	1-218-990-81	SHORT CHIP	0		
R648	1-218-990-81	SHORT CHIP	0		
R651	1-218-990-81	SHORT CHIP	0		
R655	1-218-990-81	SHORT CHIP	0		
R656	1-216-295-91	SHORT CHIP	0		
R658	1-216-821-11	METAL CHIP	1K	5%	1/10W
R661	1-218-990-81	SHORT CHIP	0		
R701	1-216-864-11	SHORT CHIP	0		
R703	1-218-941-81	RES-CHIP	100	5%	1/16W
R705	1-218-965-11	RES-CHIP	10K	5%	1/16W
R706	1-218-953-11	RES-CHIP	1K	5%	1/16W
R709	1-218-941-81	RES-CHIP	100	5%	1/16W
R710	1-218-965-11	RES-CHIP	10K	5%	1/16W
R711	1-218-965-11	RES-CHIP	10K	5%	1/16W
R712	1-218-965-11	RES-CHIP	10K	5%	1/16W
R713	1-218-965-11	RES-CHIP	10K	5%	1/16W
R714	1-218-965-11	RES-CHIP	10K	5%	1/16W
R715	1-218-965-11	RES-CHIP	10K	5%	1/16W

Ref. No.	Part No.	Description			Remarks
R717	1-208-910-11	METAL CHIP	9.1K	0.5%	1/16W
R718	1-218-938-11	RES-CHIP	56	5%	1/16W
R719	1-218-938-11	RES-CHIP	56	5%	1/16W
R721	1-218-938-11	RES-CHIP	56	5%	1/16W
R722	1-218-938-11	RES-CHIP	56	5%	1/16W
R723	1-218-864-11	METAL CHIP	5.1K	0.5%	1/10W
R733	1-218-935-11	RES-CHIP	33	5%	1/16W
R812	1-218-965-11	RES-CHIP	10K	5%	1/16W
R816	1-218-937-11	RES-CHIP	47	5%	1/16W
R817	1-218-935-11	RES-CHIP	33	5%	1/16W
R821	1-218-955-11	RES-CHIP	1.5K	5%	1/16W
R823	1-218-931-11	RES-CHIP	15	5%	1/16W
R825	1-218-939-11	RES-CHIP	68	5%	1/16W
R826	1-218-935-11	RES-CHIP	33	5%	1/16W
R827	1-218-941-81	RES-CHIP	100	5%	1/16W
R836	1-218-990-81	SHORT CHIP	0		
R839	1-218-990-81	SHORT CHIP	0		
R840	1-218-990-81	SHORT CHIP	0		
R841	1-218-990-81	SHORT CHIP	0		
R842	1-218-990-81	SHORT CHIP	0		
R1002	1-218-990-81	SHORT CHIP	0		
R1003	1-218-990-81	SHORT CHIP	0		
R1008	1-218-990-81	SHORT CHIP	0		
R1009	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1010	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1011	1-218-962-11	RES-CHIP	5.6K	5%	1/16W
R1012	1-218-990-81	SHORT CHIP	0		
R1030	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1035	1-218-990-81	SHORT CHIP	0		
R1037	1-218-961-11	RES-CHIP	4.7K	5%	1/16W
R1039	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1042	1-218-990-81	SHORT CHIP	0		
R1043	1-218-990-81	SHORT CHIP	0		
R1044	1-218-933-11	RES-CHIP	22	5%	1/16W
R1045	1-218-933-11	RES-CHIP	22	5%	1/16W
R1046	1-218-933-11	RES-CHIP	22	5%	1/16W
R1047	1-218-933-11	RES-CHIP	22	5%	1/16W
R1051	1-218-953-11	RES-CHIP	1K	5%	1/16W
R1053	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1055	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1057	1-218-965-11	RES-CHIP	10K	5%	1/16W
R1060	1-218-990-81	SHORT CHIP	0		
R1062	1-218-990-81	SHORT CHIP	0		
R1063	1-218-990-81	SHORT CHIP	0		
R1064	1-218-990-81	SHORT CHIP	0		
R1065	1-218-990-81	SHORT CHIP	0		
R1066	1-218-990-81	SHORT CHIP	0		
R1067	1-218-990-81	SHORT CHIP	0		
R1068	1-218-941-81	RES-CHIP	100	5%	1/16W

< COMPOSITION CIRCUIT BLOCK >

RB101	1-234-372-11	RES, NETWORK	100 (1005X4)
RB102	1-234-372-11	RES, NETWORK	100 (1005X4)
RB103	1-234-372-11	RES, NETWORK	100 (1005X4)
RB104	1-234-372-11	RES, NETWORK	100 (1005X4)
RB105	1-234-400-21	CONDUCTOR, NETWORK	(2010X4)
RB106	1-234-702-11	RES, NETWORK	68 (1005X4)
RB107	1-234-702-11	RES, NETWORK	68 (1005X4)
RB108	1-234-702-11	RES, NETWORK	68 (1005X4)
RB109	1-234-702-11	RES, NETWORK	68 (1005X4)
RB110	1-242-963-21	RES, NETWORK	33 (1005X4)

RD-060 POWER BLOCK

Ref. No.	Part No.	Description	Remarks
RB111	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB112	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB113	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB114	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB115	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB116	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB117	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB118	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB119	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB120	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB121	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB122	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB123	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB124	1-242-963-21	RES, NETWORK 33 (1005X4)	
RB149	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB150	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB151	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB152	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB154	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB155	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB156	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB157	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB158	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB159	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB160	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB161	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB162	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB163	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB168	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB169	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB170	1-234-380-21	RES, NETWORK 47K (1005X4)	
RB175	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB179	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB180	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB181	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB182	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB183	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB184	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB185	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB186	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB501	1-234-379-21	RES, NETWORK 22K (1005X4)	
RB502	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB503	1-234-400-21	CONDUCTOR, NETWORK (2010X4)	
RB601	1-234-381-21	RES, NETWORK 100K (1005X4)	
RB602	1-234-378-21	RES, NETWORK 10K (1005X4)	
RB701	1-234-371-21	RES, NETWORK 47 (1005X4)	
RB702	1-234-371-21	RES, NETWORK 47 (1005X4)	
RB703	1-234-371-21	RES, NETWORK 47 (1005X4)	
		< VIBRATOR >	
* X701	1-813-695-11	VIBRATOR, CRYSTAL 24.576MHZ	
X801	1-781-867-21	VIBRATOR, CRYSTAL 27MHz	

Ref. No.	Part No.	Description	Remarks
⚠	1-468-959-11	POWER BLOCK (SRV-1854UC)	
		**********	
		< CAPCITOR >	
⚠C101		0.1uF 250V	
⚠C102		0.1uF 250V	
⚠C103		100pF 250V	
⚠C104		100pF 250V	
⚠C112		680pF 250V	
⚠C114		680pF 250V	
		< CONNECTOR >	
⚠CN101		AC INLET	
		< FUSE >	
⚠F101		FUSE T3.15A/250V	
⚠P201		FUSE,CHIP 3.15A	
⚠P301		FUSE,CHIP 2A	
⚠P502		FUSE,CHIP 2A	
⚠P601		FUSE,CHIP 2A	
⚠P602		FUSE 3A	
		< LINE FILTER >	
⚠L101		LFT	
⚠L102		LFT	
		< PHOTO COUPLER >	
⚠PC101		PHOTO COUPLER PS2561AL1	
		< RESISTOR >	
⚠R101		RES,CARBON 2.2M 1/2W	
		< TRANSFORMER >	
⚠T101		TRANSFORMER SWITCHING	
		ACCESSORIES & PACKING MATERIALS	
		**********	
	1-479-551-11	REMOTE COMMANDER (RMT-D229A)	
	1-751-271-71	CORD, CONNECTION (AV)	
	1-765-635-71	CORD, CONNECTION (NTSC)	
⚠	1-823-701-11	CORD, POWER	
	1-824-933-21	CORD WITH CONNECTOR	
	1-828-146-21	CORD, CONNECTION (RF)	
	2-672-839-11	MANUAL, INSTRUCTION (ENGLISH)	
	2-672-839-21	MANUAL, INSTRUCTION (FRENCH)(Canadian)	
	2-658-476-01	COVER, BATTERY (FOR RMT-D229A)	

Note :
The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

Note :
Les composants identifiés par une marque ⚠ sont critiques pour la sécurité.
Ne les remplacer que par une pièce portant le numéro spécifié.

Sony Corporation
Home Electronics Network Company

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